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## DEPARTMENT OF GEOGRAPHY.

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### THE EXPEDITION IN SEARCH FOR SIR JOHN FRANKLIN.

As is well known, the last expedition sent out in search of Sir John Franklin and his party, under command of Captain McClintock, returned to England in September last, having been entirely successful in verifying the correctness of Dr. Rae's discoveries, and in obtaining such additional information as has completely cleared up the fate of Sir John Franklin's expedition. The narrative of Captain McClintock which is subjoined, recites in a brief, but expressive manner, the history of his expedition which has so long engaged the attention and sympathy of the civilized world: .

#### CAPTAIN MCCLINTOCK'S NARRATIVE.

It will be remembered that the *Fox* effected her escape out of the main pack in Davis' Straits, in lat.  $63\frac{1}{2}$ ° N., on the 25th of April, 1858, after a winter's ice drift of 1,194 geographical miles. The small settlement of Holsteinborg was reached on the 28th, and such very scanty supplies obtained as the place afforded.

On the 8th of May our voyage was recommenced; Godhaven and Upernivik visited, Melville Bay entered early in June, and crossed to Cape York by the 26th; here some natives were communicated with; they immediately recognized Mr. Petersen, our interpreter, formerly known to them in the Grinnell expedition, under Dr. Kane.

It was not until the 27th of July that we reached Pond's Inlet, owing to a most unusual prevalence of ice in the northern portion of Baffin's Bay, and which rendered our progress since leaving Holsteinborg one of increasing struggle. Without steam power we could have done nothing. Here only one old woman and a boy were found, but they served to pilot us up the inlet for 25 miles, when we arrived at their village. For about a week we were in constant and most interesting communication with these friendly people. Briefly, the information obtained from them was, that nothing whatever respecting the Franklin expedition had come to their knowledge, nor had any wrecks within the last 20 or 30 years reached their shores.

Leaving Pond's Inlet on the 6th of August we reached Beechy Island on the 11th, and landed a handsome marble tablet, sent on board for this purpose by Lady Franklin, bearing an appropriate inscription to the memory of our lost countrymen in the *Erebus* and *Terror*. The provisions and stores seemed in perfect order, but a small boat was much damaged from having been turned over and rolled along the beach by a storm. The roof of the house received some necessary repairs. Having embarked some coals and stores we stood in need of, and touched at Cape Hotham on the 16th, we sailed down Peel Strait for twenty-five miles on the 17th, but finding the remainder of this channel covered with unbroken ice, I determined to make

for Bellot Strait on the 19th August ; examined into supplies remaining at Port Leopold, and left there a whale boat which we brought away from Capa Hotham for the purpose, so as to aid in our retreat should we be obliged eventually to abandon the *Fox*. The steam launch had been forced higher up on the beach, and somewhat damaged by the ice. Prince Regent's Inlet was unusually free from ice; but very little was seen during our run down to Brentford Bay, which we reached on the 20th of August. Bellot Strait, which communicates with the Western Sea, averages one mile in width by 17 or 18 miles in length. At this time it was filled with drift ice, but as the season advanced became perfectly clear; its shores are in many places faced with lofty granite cliffs, and some of the adjacent hills rise 1,600 feet; the tides are very strong, running six or seven knots at the springs. On the 6th September we passed through Bellot Strait without obstruction, and secured the ship to fixed ice across its western outlet. From here, until the 27th, when I deemed it necessary to retreat into winter quarters, we constantly watched the movements of the ice in the western sea or channel. In mid-channel it was broken up and drifting about; gradually the proportion of water increased, until at length the ice which intervened was reduced to three or four miles in width. But this was firmly held fast by numerous islets, and withstood the violence of the autumn gales. It was tantalizing beyond description thus to watch from day to day the free water we could not reach, and which washed the rocky shore a few miles to the southward of us?

The winter was unusually cold and stormy. Arrangements were completed during the winter for carrying out our intended plan of search. I felt it to be my duty personally to visit Marshal Island, and in so doing, purposed to complete the circuit of King William's Island.

To Lieut. Hobson I allotted the search of the western shore of Boothia to the magnetic pole, and from Gateshead Island westward to Wynniatt's furthest. Capt. Allen Young, our sailing

master, was to trace the shore of Prince of Wales' Land, from Lieut. Browne's furthest, and also to examine the coast from Bellot Strait northward, to Sir James Ross' furthest.

Early spring journeys were commenced on the 17th of Feb., 1859, by Capt. Young and myself, Capt. Young carrying his depot across to Prince of Wales' Land, while I went southward, towards the magnetic pole, in the hope of communicating with the Esquimaux, and obtaining such information as might lead us at once to the object of our search.

I was accompanied by Mr. Petersen, our interpreter, and Alex. Thompson, quartermaster. We had with us two sledges, drawn by dogs. On the 28th of February, when near Cape Victoria, we had the good fortune to meet a small party of natives, and were subsequently visited by about 45 individuals.

For four days we remained in communication with them, obtaining many relics, and the information that several years ago a ship was crushed by the ice off the north shore, off King William's Island, but that all her people landed safely, and went away to the Great Fish River, where they died. This tribe was well supplied with wood obtained, they said, from a boat left by the white men on the Great River.

We reached our vessel after 25 days' absence, in good health, but somewhat reduced by sharp marching and the unusually severe weather to which we had been exposed. For several days after starting, the mercury continued frozen.

On the 2d of April our long-projected spring journeys were commenced ; Lieut. Hobson accompanied me as far as Cape Victoria, each of us had a single sledge drawn by four men, and an auxiliary sledge drawn by six dogs. This was all the force we could muster.

Before separating we saw two Esquimaux families living out upon the ice in snow huts ; from them we learned that a second ship had been seen off King William's Island, and that she drifted ashore on the fall of the same year. From this ship they had obtained a vast deal of wood and iron.

I now gave Lieut. Hobson directions to search

for the wreck, and to follow up any traces he might find upon King William's Island.

Accompanied by my own party and Mr. Petersen, I marched along the east shore of King William's Island, occasionally passing deserted snow huts, but without meeting natives till the 8th of May, when off Cape Norton we arrived at a snow village containing about thirty inhabitants. They gathered about us without the slightest appearance of fear or shyness, although none had ever seen living white people before. They were most willing to communicate all their knowledge and barter all their goods, but would have stolen everything had they not been very closely watched. Many more relics of our countrymen were obtained; we could not carry away all we might have purchased. They pointed to the inlet we had crossed the day before, and told us that one day's march up it, and thence four days overland, brought them to the wreck.

None of these people had been there since 1857-8, at which time they said but little remained, their countrymen having carried away everything.

Most of our information was received from an intelligent old woman; she said it was in the fall of the year that the ship was forced ashore; many of the white men dropped by the way as they went towards the Great Fish River; but this was only known to them in the winter following, when their bodies were discovered.

They all assured us that we would find natives upon the south shore, at the Great River, and some few at the wreck; but unfortunately this was not the case. Only one family were met off Point Booth, and none at Montreal Island or any place subsequently visited.

Point Ogle, Montreal Island, and Barrow Island were searched without finding anything, except a few scraps of copper and iron in an Esquimaux hiding-place.

Recrossing the Strait to King William's Island, we continued the examination of the southern shore without success until the 24th of May, when about ten miles eastward of Cape Herschel, a bleached skeleton was found, around

which lay fragments of European clothing. Upon carefully removing the snow a small pocket-book was found, containing a few letters. These, although much decayed, may yet be deciphered. Judging from the remains of his dress, this unfortunate young man was a steward or officer's servant, and his position exactly verified the Esquimaux's assertion, that they dropped as they walked along.

On reaching Cape Herschel next day, he examined Simpson's Cairn, or rather what remains of it, which is only four feet high, and the central stones have been removed, as if by men seeking something within it. My impression at the time, and which I still retain, is that records were deposited there by the retreating crews, and subsequently removed by the natives.

After parting from me at Cape Victoria on the 28th of April, Lieut. Hobson made for Cape Felix. At a short distance westward of it he found a very large cairn, and close to it three small tents, with blankets, oil clothes, and other relics of a shooting or a magnetic station; but although the cairn was dug under, and a trench dug all round it at a distance of 10 feet, no record was discovered. A piece of blank paper folded up was found in the cairn, and two broken bottles, which may, perhaps, have contained records, lay beside it among some stones which had fallen from the top. The most interesting of the articles discovered here, including a boat's ensign, were brought away by Mr. Hobson. About two miles further to the southwest a small cairn was found, but neither records or relics obtained. About three miles north of Point Victory a second small cairn was examined, but only a broken pick-axe and empty canister found.

On the 6th of May, Lieut. Hobson pitched his tent beside a large cairn upon Mount Victory. Lying among some loose stones which had fallen from the top of this cairn, we found a small tin case containing a record, the substance of which is briefly as follows: "This cairn was built by the Franklin Expedition, upon the assumed site of Sir James Ross' pillar, which

had not been found. The *Erebus* and *Terror* spent their first winter at Beechy Island, after having ascended Wellington Channel to  $72^{\circ}$  N., and returned by the west side of Cornwallis Island. On the 12th of September, 1846, they were beset in lat.  $80^{\circ} 05'$  N., and long.  $98^{\circ} 23'$  W. Sir J. Franklin died on the 11th of June, 1847. On the 22d of April, 1848, the ships were abandoned five leagues to the N.N.W. of Point Victory, and the survivors, 105 in number, landed here under the command of Capt. Crozier." This paper was dated April 25, 1848, and upon the following day they intended to start for the Great Fish River. The total loss by deaths in the expedition up to this date was nine officers and fifteen men. A vast quantity of clothing and stores of all sorts lay strewed about, as if here every article was thrown away which could possibly be dispensed with; pick-axes, shovels, boats, cooking utensils, ironwork, rope, blocks, canvas, a dip circle, a sextant, engraved "Frederic Hornby, R. N.," a medicine chest, oars, etc.

A few miles southward, across Back Bay, a second record was found, having been deposited by Lieut. Gore and M. des Voeux in May, 1847. It afforded no additional information.

Lieut. Hobson continued his search until within a few days' march of Cape Herschell, without finding any trace of the wreck or of natives. He left full information of his important discoveries for me; therefore, when returning northward by the west shore of King William's Island, I had the advantage of knowing what had already been found.

Soon after leaving Cape Herschell the traces of natives became less numerous and less recent, and after rounding the west point of the island they ceased altogether. This shore is extremely low, and almost utterly destitute of vegetation. Numerous banks of shingle and low islets lie off it, and beyond these Victoria Strait is covered with heavy and impenetrable packed ice.

When in lat.  $69^{\circ} 09'$  N., and long.  $99^{\circ} 27'$  W., we came to a large boat, discovered by Lieut. Hobson a few days previously, as his no-

tice informed me. It appears that this boat had been intended for the ascent of the Fish River, but was abandoned apparently upon a return journey to the ships, the sledge upon which she was mounted being pointed in that direction. She measured 28 feet in length, by  $7\frac{1}{2}$  feet wide, was most carefully fitted, and made as light as possible, but the sledge was of solid oak, and almost as heavy as the boat.

A large quantity of clothing was found within her, also two human skeletons. One of these lay in the after part of the boat, under a pile of clothing; the other, which was much more disturbed, probably by animals, was found in the bow. Five pocket watches, a quantity of silver spoons and forks, and a few religious books, were also found, but no journals, pocket-books, or even names upon any articles of clothing. Two double-barrelled guns stood upright against the boat's side precisely as they had been placed eleven years before. One barrel in each was loaded and cocked; there was ammunition in abundance, also thirty pounds or forty pounds of chocolate, some tea and tobacco. Fuel was not wanting; a drift tree lay within one hundred yards of the boat.

Many very interesting relics were brought away by Lieutenant Hobson, and some few by myself. On the 5th of June I, reached Point Victory without having found anything further. The clothing, etc., was again examined for documents, note-books, etc., without success, a record placed in the cairn, and another buried 10 feet true north of it.

Nothing worthy of remark occurred upon my return journey to the ship, which we reached on the 19th of June, five days after Lieutenant Hobson.

The shore of King William's Island, between its north and west extremes, Capes Felix and Crozier, has not been visited by Esquimaux since the abandonment of the *Erebus* and *Terror*, as the cairns and articles lying strewed about, which are in their eyes of priceless value, remain untouched.

If the wreck still remains visible, it is probable she lies upon some of the off-lying islets

to the southward between Capes Crozier and Herschel.

On June 28, Captain Young and his party returned, having completed their portion of the search, by which the insularity of Prince of Wales' Land was determined, and the coast line intervening between the extreme points reached by Lieutenants Osborne and Browne discovered; also between Bellot Strait and Sir James Ross' furthest in 1849, at Four River Bay.

Fearing that his provisions might not last out the requisite period, Captain Young sent back four of his men, and for 40 days journeyed on through fogs and gales with but one man and the dogs, building a snow hut each night; but few men could stand so long a continuance of labor and privation, and its effect upon Capt. Young was painfully evident.

Lieutenant Hobson was unable to stand without assistance, upon his return on board; he was not in good health when he commenced his long journey, and the sudden severe exposure brought on a severe attack of scurvy, yet he most nobly completed his work; and such facts will more clearly evince the unflinching spirit with which the object of our voyage has been pursued in these detached duties than any praise of mine.

We were now, at length, all on board again. As there were some slight cases of scurvy, all our treasured resources of Burton ale, lemon juice and fresh animal food were put into requisition, so that in a short time all were restored to sound health.

During our sojourn in Port Kennedy we were twice called upon to follow a shipmate to the grave. Mr. George Brands, engineer, died of apoplexy on the 6th of November, 1858. He had been out deer shooting several hours that day, and appeared in excellent health.

On the 14th of June, 1859, Thomas Blackwell, ship's steward, died of scurvy. This man had served in two of the former searching expeditions. The summer proved a warm one; we were able to start upon our homeward voyage on the 9th of August, and although the loss of the engine-driver in 1857, and the engineer

in 1858, left us with only two stokers, yet, with their assistance, I was able to control the engines and steam the ship up to Fury Point.

For six days we lay there closely beset, when a change of wind removing the ice, our voyage was continued almost without further interruption to Godhaven in Disco, where we arrived on the 27th of August, and were received with great kindness by Mr. Orlick, Inspector of North Greenland, and the local authorities, who obligingly supplied our few wants.

The two Esquimaux dog-drivers were now discharged, and on the 1st of September we sailed for England.

From all that can be gleaned from the record paper, and the evidence afforded by the boat, and various articles of clothing and equipment discovered, it appears that the abandonment of the *Erebus* and *Terror* had been deliberately arranged, and every effort exerted during the third winter to render the traveling equipments complete.

It is much to be apprehended that disease had greatly reduced the strength of all on board, far more perhaps than they themselves were aware of.

The distance by sledge route, from the position of the ships when abandoned, to the boat is 65 geographical miles; and from the ships to Montreal Island 220 miles.

The most perfect order seems to have existed throughout.

In order to extend as much as possible the public utility of this voyage, magnetical, meteorological, and other observations, subservient to public purposes, and for which instruments were supplied through the liberality of the Royal Society, have been continually and carefully taken, and every opportunity has been embraced by the surgeon, D. Walker, M. D., of forming complete collections in all the various branches of natural history.

This report would be incomplete did I not mention the obligations I have been laid under to the companions of my voyage, both officers and men, by their zealous and unvarying support throughout.

A feeling of entire devotion to the cause, which Lady Franklin has so nobly sustained, and a firm determination to effect all that men could do, seems to have supported them through every difficulty. With less of this enthusiastic spirit, and cheerful obedience to every command, our small number—23 in all—would not have sufficed for the successful performance of so great a work.

F. L. MCCLINTOCK, Captain, R.N.,  
Commanding the Final Searching Expedition.

The yacht *Fox*, R.Y.S., off the Isle of Wight, Wednesday, Sept. 21, 1859.

#### NAVIGATION OF THE MISSOURI.

It has been demonstrated by the enterprise of the American Fur Company that the Missouri River is navigable for steamboats to Fort Benton, a point within 60 miles of the head-water of the Columbia, and 3,120 miles from the Mississippi. The *Chippewa* left St. Louis on the 1st June and the mouth of the Yellow Stone 3d July, and arrived at Fort Benton on the 17th July, with 130 tons of freight, consisting of Indian annuities and the outfit belonging to the Fur Company. Starting on her return, on the 18th July, she was at the mouth of White River on 2d August, and arrived at St. Louis on the 19th August, having made the voyage of 6,240 miles in 80 days. Very little trouble was experienced in ascending the river above the Yellow Stone, excepting at Douphain's Rapids, over which the steamer was hauled by line. The trip has thus demonstrated the practicability of navigating the upper river, and with greater certainty since the *Chippewa* succeeded during a low stage of water. One month earlier she would have had no difficulty at the rapids before mentioned.

#### SOUTH CAROLINA: HER NATURAL RESOURCES AND AGRICULTURAL PRODUCTS, BY OSCAR M. LIEBER, STATE GEO- LOGIST OF SOUTH CAROLINA.

A cursory notice of those peculiar features of South Carolina, which are connected with her agricultural and mineral wealth, will scarce-

ly fail to interest even distant readers. Under this impression, I, therefore, now beg leave to present a map, prepared for the fourth annual report on the geognostic survey of South Carolina,\* on which I have represented the zones of the different agricultural productions, and the localities of different minerals of value. On a smaller map on the same plate the areas of indigenous forest growth are exhibited.

Maps of this description are capable of throwing so much light upon the occupation, habits, commerce and prospects of a people, and upon the internal and external importance of a country, that it is not unnatural to express surprise at the comparatively few and meagre contributions of the kind which our confederacy has hitherto furnished. At all events this deviation from the prescribed, or a least adopted, schedule of ordinary geognostic reports is sufficiently excusable upon the grounds of the importance of the subject.

The plate thus offered scarcely demands any very extended explanation; but still a brief communication should accompany it.

In glancing over the map, the reader will very soon be struck by the fact that, crossing the State, near the centre, in a northeasterly direction, several lines appear in close proximity, and thus divide the State into two sections. These lines are:

1. The boundary of the crystalline rocks.
2. The boundary of the pine barrens.
3. The boundary of corn as a staple.

To these we might also add as closely approximating to them:

4. The lower boundary of small grain.
5. The line above which gold occurs.

It is easily conceived that the coincidence of a number of boundary lines, of such importance in their direct connection with practical pursuits, must exert very powerful influences upon the character of the inhabitants of the two regions thus separated—an influence which is observable in the occupation, habits, thoughts, standard of education and even politics of the

\* Not yet published.

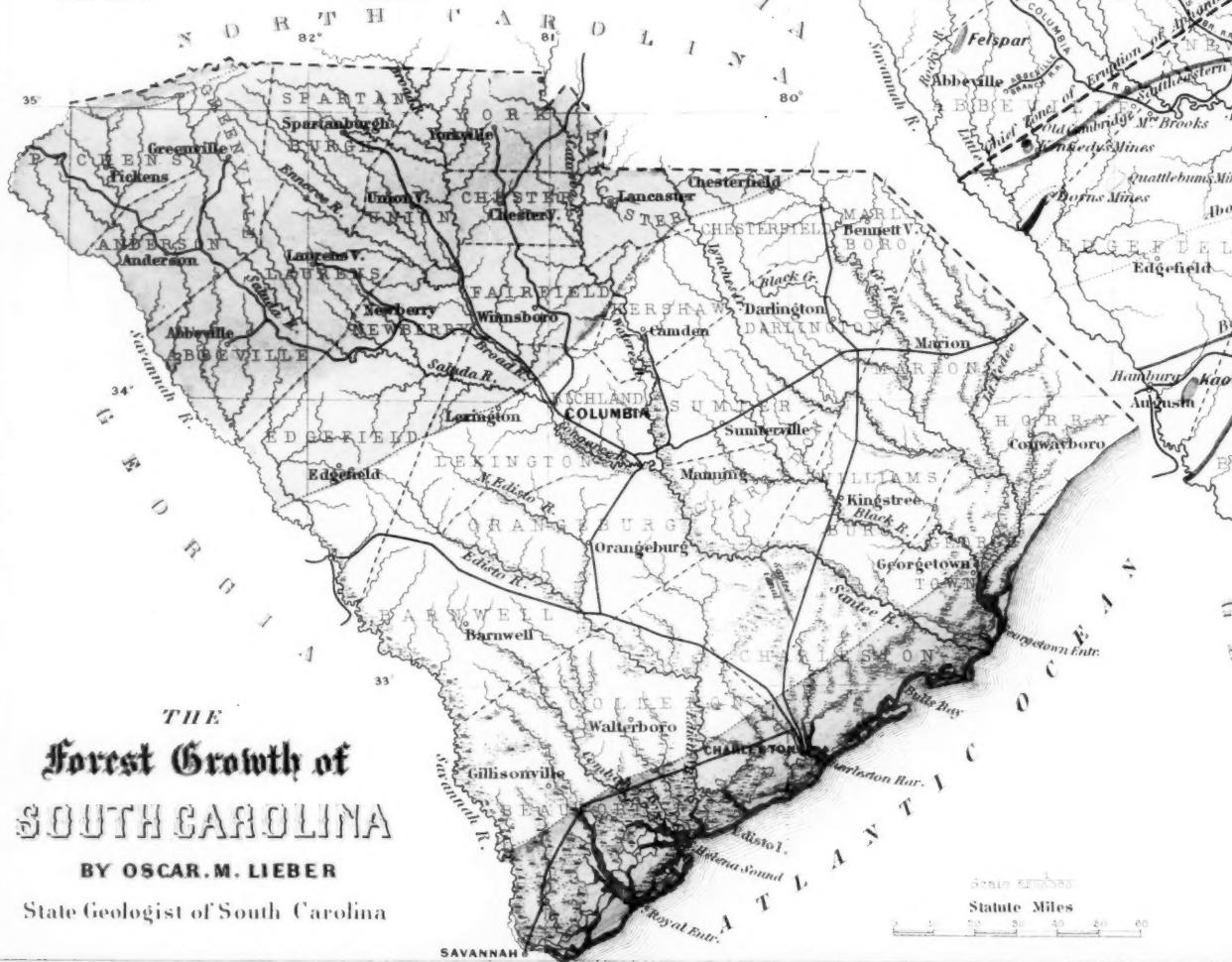
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Reference to the "Industrial Map"

Boundary of Crystalline Rocks	
Boundary of Agricultural Products	
Gold	Iron
Lead	Limestone
Manganese	Felspar &
Copper	Kutolin

Reference to Map of Forest Growth

Extreme Mountain Growth	
Up country Growth	
Long Leaved Pine	
Low Country Swamp	
Coast growth	

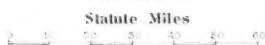


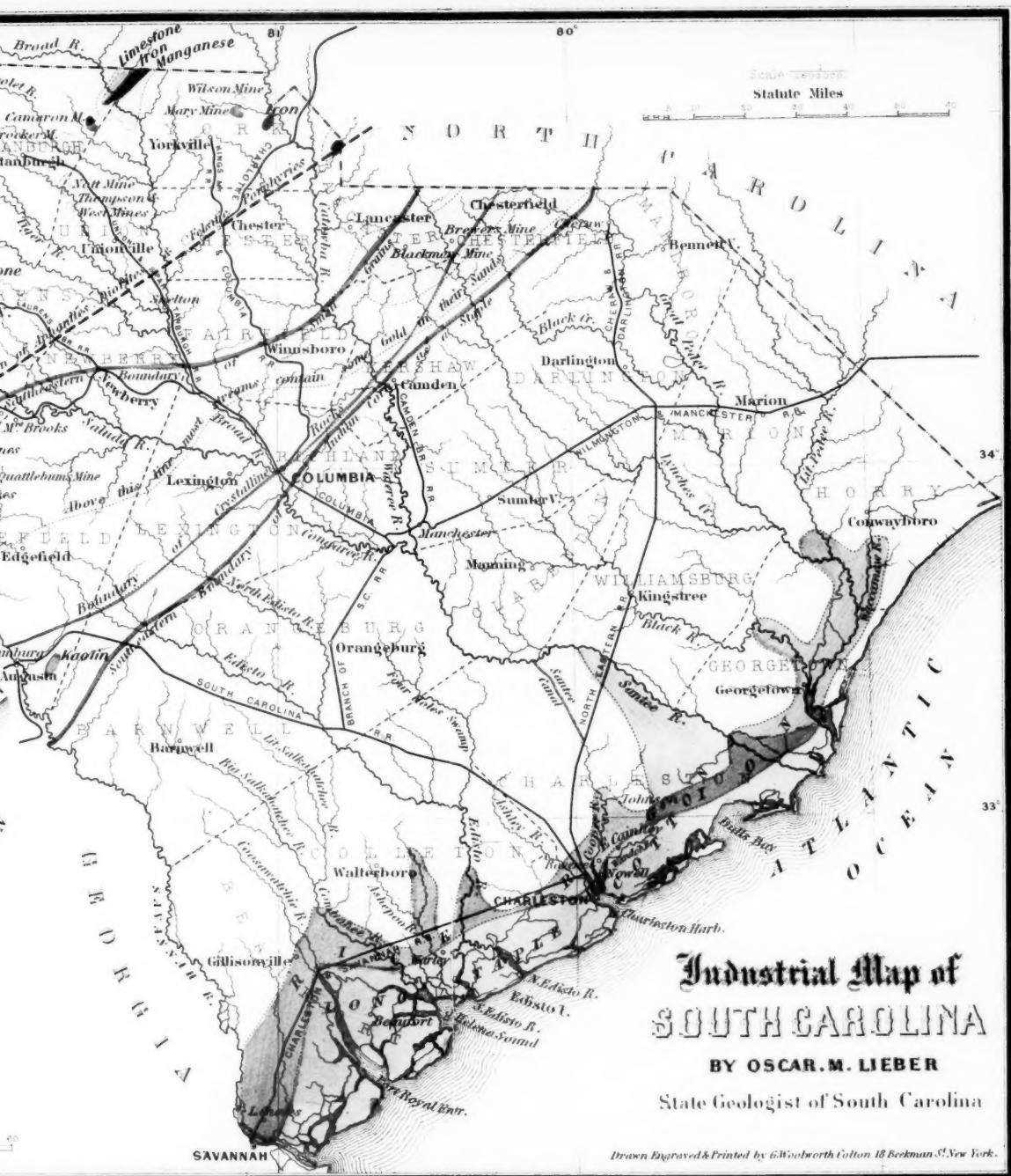
THE  
Forest Growth of  
SOUTH CAROLINA  
BY OSCAR M. LIEBER

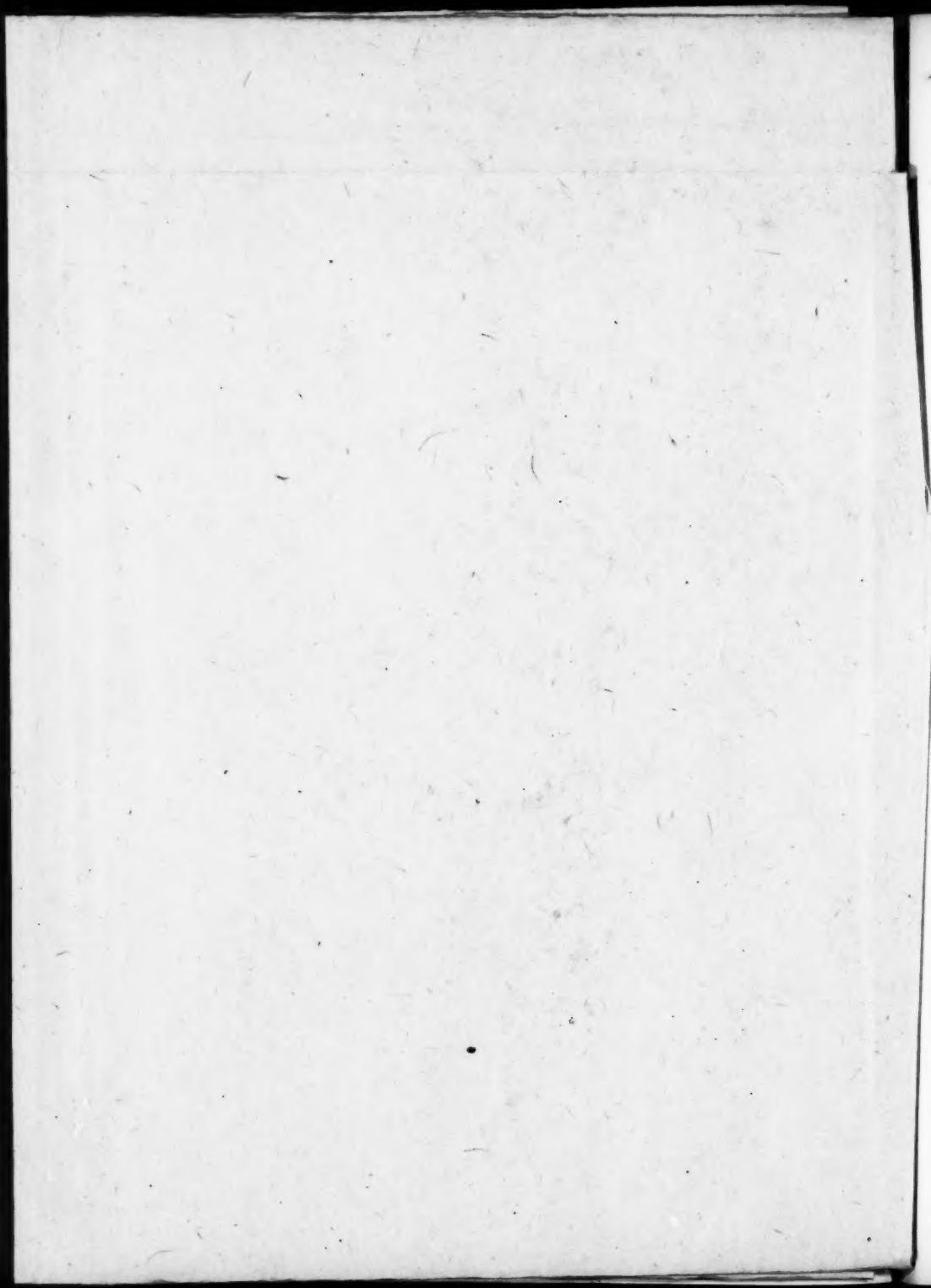
State Geologist of South Carolina

Scale in Miles

Statute Miles







two sections; for all of these are, in most instances, to a greater or less extent, the result of circumstances connected with the physical configuration of a country, its climate and natural capacities. This difference has always been acknowledged, and hence our State has in common parlance long been divided into the up-country and low country, although the separating line has never been very clearly defined.

The mineral resources of the State, inasmuch as they enjoy priority in origin, should very properly receive the same in description.

The geological survey has not yet advanced sufficiently far to enable me to offer a geological map of the entire State, but it is scarcely too early to attempt to lay down the areas of our chief mineral resources. Even there, however, we are forced to confine ourselves chiefly to those capable of exportation. The different varieties of building materials, (the superb granite of Columbia, the red sandstone of Chesterfield, etc.,) soapstones, clays, marls, etc., etc., it would be next to impossible to notice with precision.

*Gold* is at once perceived to be our most widely distributed metal. Many of its occurrences I have, however, not deemed of sufficient importance to notice.

The chief gold regions of our State are found near the junction of the dividing line of Edgefield and Abbeville Districts with the Savannah River, (embracing the justly famous mine of Mr. Dorn); and again in the southern part of Lancaster District, extending into Chesterfield (embracing the Brewer, Hale, Blackman, Stevens' and Belk's mines and others). From the geognostic, as well as geographical features of the two regions, it is probable that they were originally connected, and that their separation is due to the denuding influences of the Saluda, Broad and Wateree Rivers and their tributaries.

Another somewhat conspicuous gold region appears on the western slope of King's Mountain in York, Spartanburgh and Union, embracing the Martin deposit mine, the Darwin Mine and others, although more prominently distinguished in North Carolina by the King's

Mountain Mine. In Union we also perceive another auriferous locality on the Pacolet, embracing the Thompson and West Mines, the Nott Mine and others, all of which are vein mines.

In the farther western portions of our State no *veins* have yet been profitably worked for gold, but *gravel deposits* have occasionally been opened with success. As such I would particularize the Carson Mine in Eastern Greenville and the Cheohee Mine in Northern Pickens. Still it should be remembered that deposits of this description are necessarily finite. For a while they may yield profit; but the operations must be stopped in time to avoid unnecessary outlay.

The gold veins are of very different kinds. At least three distinct types may be distinguished; but this is not the place to enter upon their description.\* Suffice it therefore to say that here, as elsewhere, in none of them can the gold be profitably worked to any very extraordinary depth. One variety of veins entirely gives out in depth; another is restricted to a particular country rock, which is itself of no very remarkable diameter; and the last, though auriferous as far as any exploration as yet extends, contains the gold farther down in a shape inaccessible to the method ordinarily in vogue, while the lead or copper make their appearance.

*Copper* has not yet been exported by South Carolina. The Cameron Mine in Northeastern Spartanburgh, and the Mary Mine in York District, it is to be hoped will before long commence shipments of this metal. Copper is also found in Edgefield, Abbeville and Lancaster. The Cameron Mine, although at a future day it will probably be most conspicuous for its copper, is at present of more importance with regard to—

*Lead*. Indeed, it is the only mine in our State, which has hitherto furnished any market-

\* The interested reader will find more on this subject in the writer's official reports, and in an article of his "Der Itaeolumit u. seine Begleiter," in Cotta's Gangstudien," vol. III. Freiberg.

able quantity of that metal. Lead, however occurs also in Pickens and Abbeville. Very small quantities have also been found in Lancaster, but the veins have not been opened and explored.

*Bismuth* is found at the Brewer Gold Mine in Chesterfield, but has not yet been worked.

*Manganese* occurs in Kings Mountain, in the shape of a pyrolusite-bearing bed of the talcose slate. As yet it has not been found in sufficient purity for export. At Mr. Dorn's mine in Abbeville, within a short distance of the gold vein, a superb body of psilomelane, associated with pyrolusite, is observable, sometimes of a width of 50 feet, and even 100, with a perfectly vertical dip. This is probably one of the finest manganese mines in the world, although now lying idle.

*Iron* abounds on the western slope of Kings Mountain. The most admirable magnetic, and specular ores occur there in inexhaustible quantities. The production cannot, however, compare with the quantity of material, owing to the fact that coal does not occur near it, and that the timber is becoming scarce. The ores are itabirite, specular schist, and catawbarite, which occur as true rocks, belonging to the itacolumitic system. At other points in the State, iron has occasionally been produced from limonite ores; but now all these furnaces have ceased operations, the railroads making foreign iron too cheap to admit of competition, and the maintenance of fences around the fields having consumed the timber.

*Limestone* appears in York, Spartanburgh, Laurens and Pickens, and, for local consumption, is worked with profit.

*Kaolin* is found in great variety in Edgefield District, where it is employed for porcelain and chinaware, while the—

*Felspar*, needed in the manufacture of the same articles, is met with in great abundance in Eastern Pickens, and in Anderson.

On the map I have, in addition to these substances, noted the marl region, traced the boundary of the metamorphic region, and the main zone of eruption of aphanites, diorites

and felsitic porphyries, since these latter rocks, and the soils which they yield, are highly important in an agricultural point of view; and, since also they influence the geognostic characters of the up-country very materially. Within the main zone of eruption, the strike of the individual dykes is northeast. On either side their strike is northwest; a feature which is not only highly interesting, but which is accompanied by local influences upon stratified rocks traversed, of no inconsiderable importance. In some places the irregularly shaped eruptive masses have intruded themselves in such a manner as to cause great variations in the otherwise uniformly northeasterly strike of the slates. The crevices produced by the upheavals are, in consequence, in such cases variable in their direction, and thus in the vicinity of these dykes the metaliferous veins do not always present their usual course, which is parallel to the axes produced by elevation and depression.

There is a considerable variety of veins in South Carolina, which may generally be distinguished with ease, owing to marked differences in the structure of the gangue, its varying admixtures, or the peculiar characteristic shape of the crevice. Some of these types are metaliferous, and others, as far as we know, entirely barren. Almost all of them occupy definite positions, or rather distinct areas, or belts, whose general direction is dependant upon our great Southern mountain chain. These belts overlap one another; but may be traced with very great accuracy. There are a few vein types which are confined to certain rocks, and which are therefore dependant upon the presence of the latter, being omitted where erosion has removed their respective countries.\* A close examination over a large portion of our State established the perfectly developed succession of rocks to be from below:—gneiss or grey granite; hornblendic schist; micaaceous schist; talcose schist; argillaceous schist; itacolumitic series, and limestone. To these may be

\* See Report III, p. 54, where a skeleton section is given, showing the position of the vein-types.

added the red sandstone, (the same which underlies the North Carolina coal beds), and the cretaceous and tertiary formations. With regard to those enumerated above, it is scarcely necessary to remark that intercalations of other rocks may occasionally occur, without affecting the regular order of distinct varieties. Undoubtedly far too little attention has been paid in the last half century to such very generally observable regular succession of those rocks, which Naumann terms *cryptogene*, but which are more frequently spoken of as *metamorphic*. Formerly, geologists had proceeded too far in one direction; now they but too frequently go as far on the opposite. From what has been said, it is evident that denudation must influence the presence of those veins very powerfully, the position of which is restricted to a certain rock.

Before we enter upon a brief notice of the areas of cultivated plants, some remarks on those of the indigenous growth will be proper.\*

We distinguish five very strongly marked areas of natural vegetation:

- I. The extreme mountain growth.
- II. The general up country growth.
- III. The pine barren region.
- IV. The low country swamp growth
- V. The littoral growth.

The extreme mountain growth is met with in Pickens and Greenville districts. This belt is characterized by the:

Hemlock, or spruce	{	<i>Abies canadensis</i> (Michaux)
pine		

Northern, or white	{	<i>Pinus strobus</i> .
pine		

Mountain laurel	{	<i>Rhododendron maximum</i> .
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Cucumber tree	{	<i>Magnolia acuminata</i> .
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Long leafed cucumber tree.	{	<i>Magnolia auriculata</i> .
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Rock chestnut oak	..	<i>Quercus prinus monticola</i> .
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These plants follow in an increasing downward range very much as here exhibited. Thus the hemlock does not extend as far downwards as the northern pine. Farther up, in the higher mountains of North Carolina, we find also the

table mountain pine (*pinus pungens*), and the black birch (*betula lenta*), neither of which I have found in our State.

The general up-country growth presents among its characteristic trees the:

Spanish oak.....	<i>Quercus falcata</i> (Michaux).
Black walnut.....	<i>Juglans nigra</i> , "
Black oak.....	<i>Quercus tinctoria</i> , "
Chestnut.....	<i>Castanea vesca</i> ,
Scaly barked hickory.	<i>Carya Alba</i> (Elliot).
Slippery elm.....	<i>Ulmus fulva</i> , (Michaux).
Calico bush or ivy..	<i>Kalmia latifolia</i> ,
Red cedar.....	<i>Juniperus Virginiana</i> "
Short leafed pine....	<i>Pinus taeda</i> ,

To these we may add, as more widely diffused here, than lower down the country:

Chincapin.....	<i>Castanea pumila</i> , (M.)
Hickory (common) ..	<i>Juglans (Carya) tomentosa</i> .
Red oak .....	<i>Quercus rubra</i> .

The pine barren zone, which commences but little above the boundary of the tertiary formation, and extends thence to the coast, wherever the soil is sufficiently sandy to favor its growth, is characterized by the long-leaved pine (*pinus palustris* (E.) *p. australis* (M.), and a much greater abundance of black jack oaks (*quercus ferruginea*), and scrub oaks (*q. Catesbeii*). The former, often designated as the round-leaved black jack, is characteristic of soil containing some little moisture, while the latter, better known as the forked-leaved black jack, prevails only on the most arid soils of all. Sycamores (*platanus occidentalis*), persimmons (*diospyros Virginiana*), red-bud trees (*cercis canadensis*), sweet gums (*liquidambar styraciflua*), sassafras, (*laurus sassafras*), water oaks, (*quercus aquatica*), and supple-jacks (*zizyphus rotundifolia*), are more abundant here than further up the country, although with some of these is it difficult to give any portion of the State the preference.

The low country swamp growth is not bounded by any lines indicative of climate as far as the area of South Carolina extends. It is peculiar to the swamps and low grounds, which ramify through the region just described. But so extensive are our swamps, and so peculiar is a large part of their vegetation, that the latter

\* For the botanical names I am indebted to Dr. John Le Conte.

requires to be defined separately. We find here the cypress (*cupressus disticha*), the glorious magnolia (*magnolia grandiflora*), the tupelo, (*nyssa grandidentata*), the common cane, (*arundinaria macrospetra* (M. & Y.) *Arundogigantea*), the grey or long moss (*Tillandsia usneoides*), the Spanish bayonet (*Yucca gloriosa*), the winter whortle-berry (*vaccinium arboreum*), the white bay (*magnolia glauca*), among the most striking plants of these regions. The saw-palmetto, (*chamaerops serrulata*), in some cases extends up the river swamps far into the interior. I have seen it on the Savannah as high up as Abbeville district, although it is certainly one of the plants more properly belonging to

*The littoral growth.*—This vegetation is confined to a belt of country running parallel with the coast. The peculiar plants extend to different distances into the interior. Thus the cabbage palmetto, (*chamaerops palmetto*), rarely occurs more than ten miles from salt water, while the live oak (*quercus virens*) extends as far as forty. These are the two most characteristic trees of this zone. Others, which are more or less distinctive, are the loblolly bay (*gordonia lasianthus*), the American olive, (*Olea Americana*), more abundant in Georgia than with us; Georgia bark, (*pinckneya pubens*), pond spice, (*laurus geniculata*), and gall-berry (*prunus glabra*). In addition to these the swamp growth in low grounds, and the pine barren growth in sandy places, extend over the entire littoral belt.

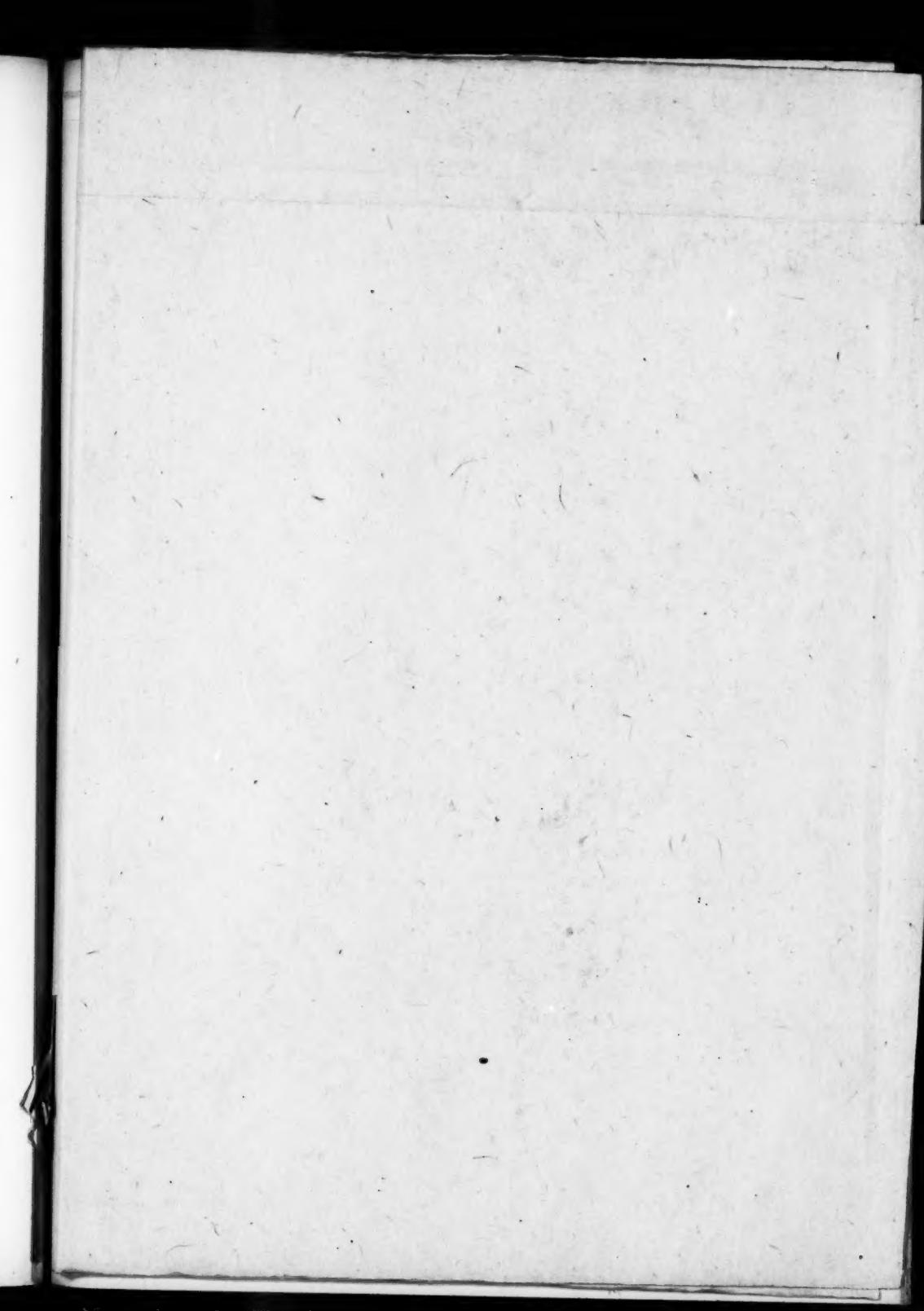
It must be self-evident to the reader, that a State, exhibiting so great and striking a variety in her natural vegetation, and such very decided differences in her soils, should also be enabled to present a great diversity in the agricultural pursuits of her inhabitants. No doubt this variety is increased, or, is, I would say, more strongly emphasized on account of the peculiar geographical position of South Carolina. We live in a latitude where the influences of elevation upon the climate are more decided in their effects upon vegetation, than farther north or south; so that from the mountains to the coast we have the most strongly marked terraces of

artificial vegetation. Along our seaboard we find the semi-tropical regions of long-stapled cotton and rice. Then we arrive at the boundary of the great short-stapled cotton zone, which extends up to the line of Pickens, although there along its northwestern limits the summer season is too short to permit its successful cultivation, except on new or highly fertilized lands. Near the boundary of the tertiary we find the lower margin by the belt where corn is grown for the market. Further up we arrive at the lower boundary of the small grain belt. We have, therefore, distinctly defined regions for the production of all the plants grown from the climates of the north to those verging upon the tropics. When the small size of our State is remembered, it will be admitted that few regions are so largely favored by nature. We have not yet fully developed our agricultural advantages by rendering the zones, alluded to, more precise and numerous—making them dependant both upon climate and normal differences of soil. But this will come in time. The profits of grape culture will soon turn more general attention in that direction. The increasing price of stock will before long establish its raising as another source of agricultural prosperity, and so also will it be with other matters, to which it is here unnecessary to attend.

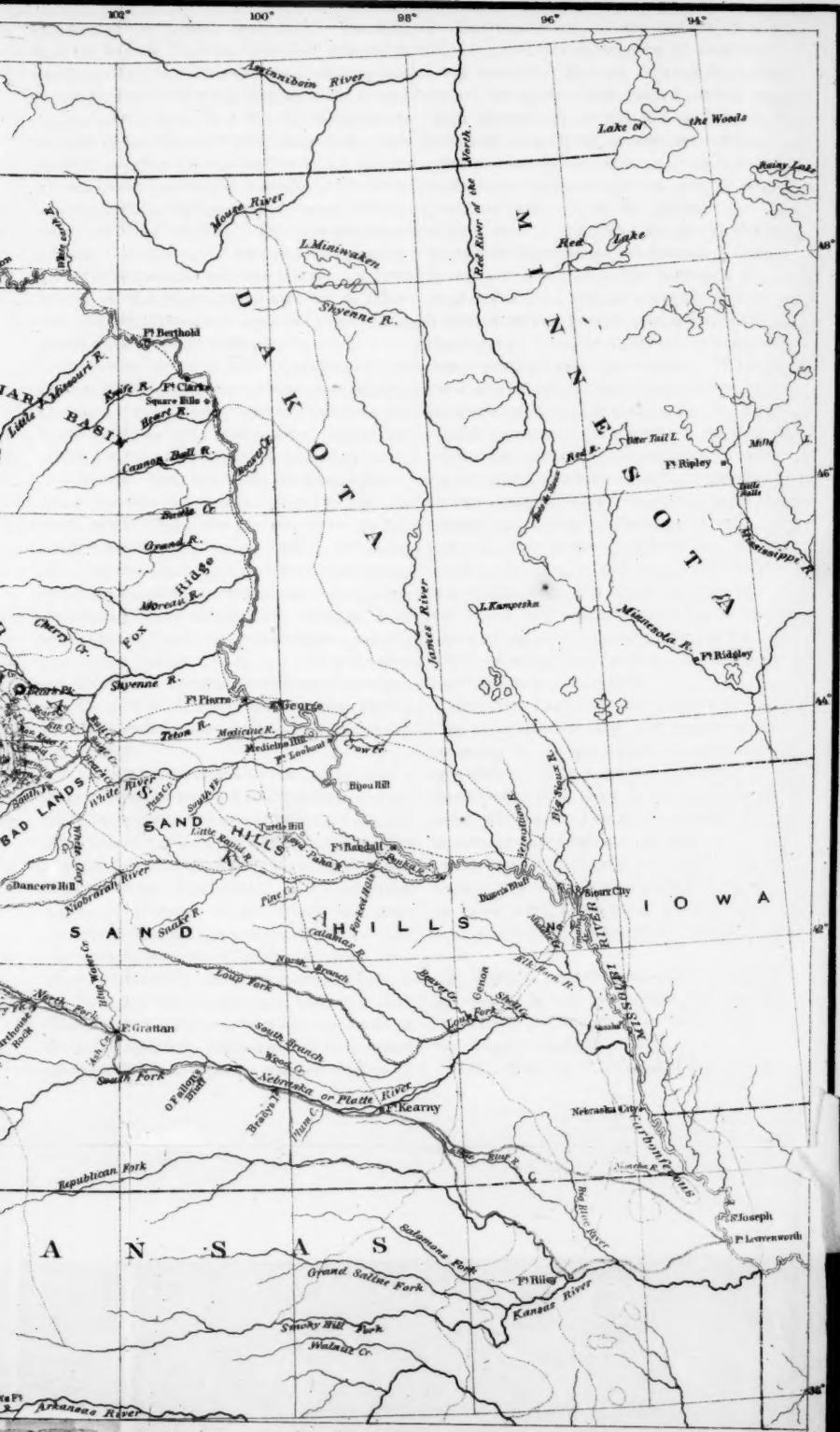
Like other States, we still require that stability of habitation with our people, which is necessary to all permanent improvement in agriculture. It is a great misfortune to the older States that there is a West with cheap and fertile lands. But as we advance in time, as western lands increase in value and our laboring force is gradually increased, while railroads hurry the produce to market, equalizing its value over the whole country—then too more decided and lasting improvements will be made.

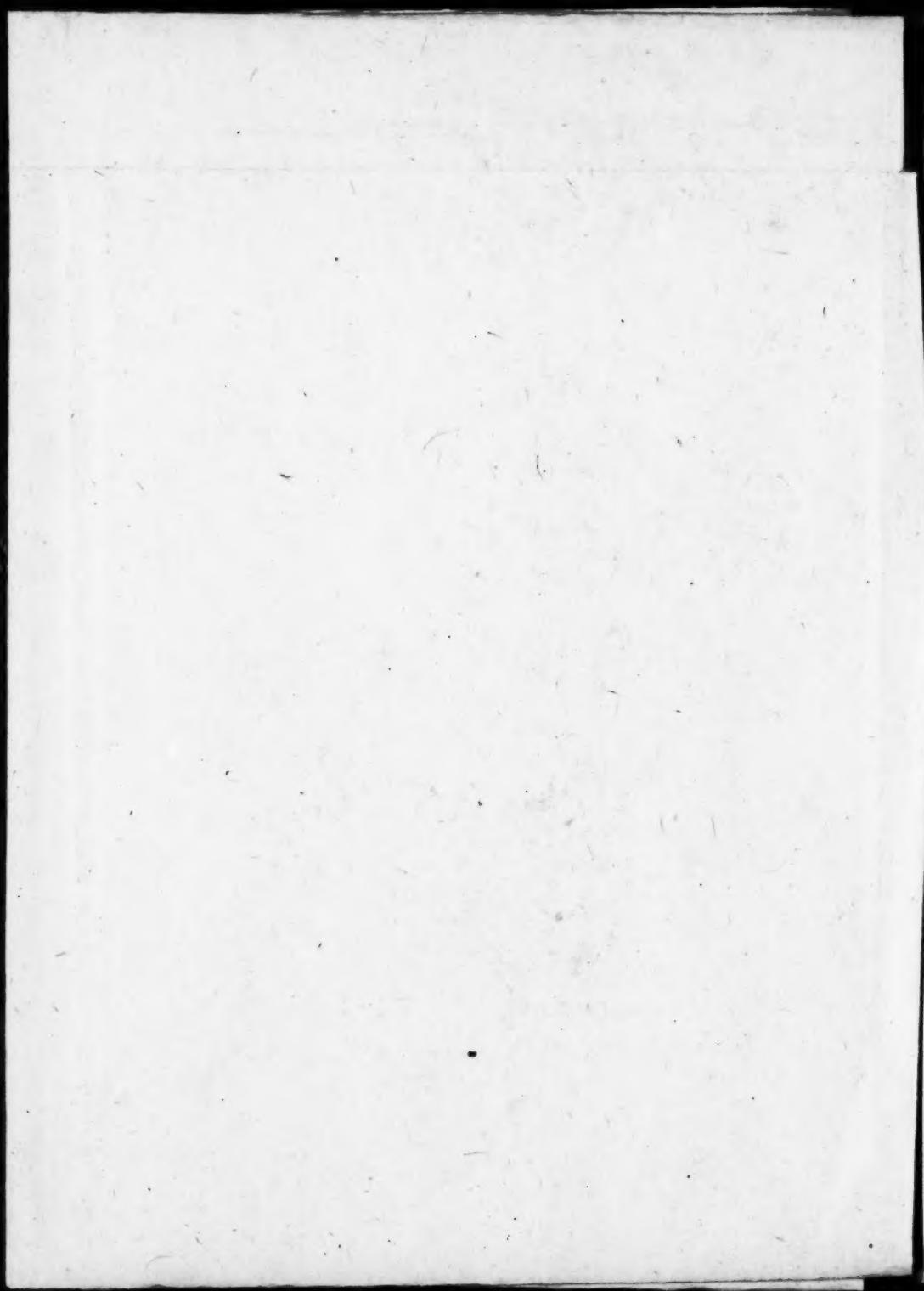
However these reflections will scarcely interest readers beyond our bounds, and this paper has already grown into more bulky dimensions than I had intended.

GEOL. SURV., S. C., Aug. 6, 1859.









### GEOGRAPHY AND RESOURCES OF NEBRASKA.\*

Nebraska Territory, according to the Act of Congress of 30th May, 1854, is bounded on the north by the parallel of 49° north latitude; on the east by the White Earth and Missouri Rivers; on the south by the parallel of 40° north latitude, and on the west by the Rocky Mountains. Within these bounds is an area equal to 335,882 square miles.

Beginning with the main range of the Rocky Mountains on the 49th parallel, their eastern base has a direction nearly northwest and southeast—the range crossing the Missouri at the “Gate of the Mountains.” Continuing southeast, it crosses the Yellow Stone near latitude 46°, immediately south of which it forms high snow-covered peaks. The range is again broken by the *Big Horn*, and the mountains adjacent thereto receive the name of that river. The southeast terminus of the Big Horn Mountains falls off into the elevated table-land prairie, and the range probably re-appears as the *Laramie* Mountains. South of the latitude of Fort Laramie, the line of the eastern front of the mountains is nearly north and south.

The Black Hills are the most eastern portion of what has heretofore been considered a part of the great mountain region west of the Mississippi; and it is worthy of note that if a line be drawn from them to the Little Rocky Mountains on the 48th parallel, which are the most eastern portion in that latitude, this line will be parallel to the line of the main front of the mountains already traced. What is still more significant is, that if a straight line be drawn from the mouth of the Yellow Stone to the mouth of the Kansas, it will also be parallel to the before-mentioned lines, and will have about an equal portion of the Missouri River on each side of it.

The eastern base of the main mountain mass is, of course, the highest of any portion of the

plains, and at Raw Hide Peak, near Fort Laramie, its elevation is about 5,500 feet, as determined by the horizontally stratified tertiary deposits; though owing to great denudation, the average height there of the plains is not so great. The plain near the 49th parallel has probably an elevation somewhat less. The lowest line of the plains is that along the Missouri; and its elevation near Bijou Hills, (a point about on the perpendicular to it from Fort Laramie), is about 2,130 feet, which does not differ materially from its height at the mouth of the Yellow Stone. The slope of all this part of the plains, (being in a direction perpendicular to the lines of equal elevation,) has therefore its line of greatest descent in a northeast direction, and north of the Niobrara; and this is the direction in which a majority of the rivers flow, till they join with the Missouri or Yellow Stone. To the south of the Niobrara the greatest slope of the plains is to the southeast, towards the Gulf of Mexico, and this is the direction pursued there by nearly all the rivers of the plains. Thus the Niobrara would seem as it were to run along the surface of a high swell or ridge. The average slope of the plains from the Missouri to the mountains makes nowhere an angle greater than one-half of a degree with the horizon.

A remarkable feature in regard to the change of slope which occurs with the course of the Niobrara, is the shortness of its tributaries; the surface drainage seeming to be *from* and not *towards* it. A result of this is the absence of the amphitheatre-like valley which rivers generally present. Through the greater portion of the middle half of its course, the observer has scarcely any indication of it till within close proximity; so completely is it hidden by the precipitous bluffs which enclose it on either side. The surface drainage, says Lt. Warren, could never have been directed along its course so as to have worn out this channel. It must have originated in a fissure in the rocks, which the waters have since enlarged and made more uniform in size, and which the soft nature of the rock would render easy of accomplishment.

\* Reduced from Lt. G. K. Warren's "Explorations in Nebraska and Dakota," in the years 1855-56 and 57. Washington: 1859.

It is worthy of remark, in this connection, that the bed of the stream in long. 102° is 400 feet higher than that of the White River at the nearest point to this. White River having there cut its way entirely through the tertiary formation, flows along the cretaceous; while the bed of the Niobrara is in the miocene tertiary, the pliocene forming the bluffs. The bed of the Niobrara is also in two-thirds of its upper course, from 300 to 500 feet above the bed of the Platte River at corresponding points at the south.

In the section of the country through which the Niobrara flows, the soil is very sandy, so that whatever rain or snow falls, it sinks under the surface, so that little is lost by evaporation. This is gradually all poured into the stream by the springs in the ravines, and in this way the river is mainly supplied in the dry seasons, in which it is one of the largest streams of the territory.

The slope of the plains is a subject to which much attention has been attracted from its scientific as well as practical interest. On this point, the barometrical observations of Lt. W.'s explorations in some measure fill up the gap between those of Gov. Stevens on the north and Fremont on the south, and thus give connected levels over a very large area.

The observations upon the great tertiary formation have developed the fact, that since the close of the pliocene period, the eastern base of the mountains, which is the western limit of this formation, has been elevated from 2,000 to 3,000 feet above the eastern, and this, without there being any visible signs of upheaval, such as inclination of the strata. The only direct evidence is in the immense denudation which the tertiary has undergone, probably while this elevation was in progress, the causes of which must have been gradually exhausted, as there is at present no force at work sufficient to have effected it. The evidence goes to show that the elevation that has taken place since the close of the pliocene, has been in Nebraska remarkably uniform, and along a line in a general direction northwest and southeast, and nearly

coincident with the ranges of the mountains previously upheaved.

The Black Hills received their last violent upheaval at the same period as the Laramie Mountains, that is, at the close of the cretaceous period. The geological evidence plainly exhibits that the pliocene and miocene tertiary, south of the Shyenne, are fresh water formations; yet there are no ridges now standing to mark the northern boundary of this basin. In the present relative position of the different parts of these plains, the elevation of the pliocene tertiary formation is now so distinct, that much of the Black Hills and the cretaceous on the Shyenne, should have been covered with it. This might, however, have been the case, but all is now denuded. North of the Shyenne, the cretaceous ridges are probably sufficiently high to have separated the tertiary beds south of it, from the lignite tertiary to the north. But still it is necessary to suppose that this last elevation of the tertiary has been somewhat greater near the 42d parallel than to the north of it.

A most interesting problem could be solved in regard to these changes of level, if a locality could be found where the lignite tertiary north of the Shyenne would be in contact with the pliocene or miocene beds to the south of it; as well as the more important one of the age of the first relative to the two latter.

During the time of these changes since the formation of the pliocene tertiary, the soft sandy material of which it was composed has been crushed and separated by denuding forces, and an area of no less than 20,000 square miles, called the *Sand Hills*, has been covered with barren sand, which, blown by the wind into hills, renders this section notoriously barren, and in a measure impracticable for travel. The Niobrara River, lying on a most desirable line of communication and direct in its general course, has 100 miles of its banks obstructed with these sand hills, and the communication of this stream and the Platte greatly obstructed, and in some places entirely cut off.

From what has been said it will be seen that

the surface of Nebraska presents two great sections—one of plains, the other of mountains. The plains are composed of nearly horizontal strata of the tertiary and cretaceous formations, except in a small portion of the southeast corner where the carboniferous is developed. Though much diversified by the effect of denuding agencies, and presenting in different portions striking characteristics, yet they on the whole present a pretty uniform surface, gradually rising towards the mountains, at the base of which they attain an elevation varying from 3,000 to 5,500 feet above sea level. These plains, as determined by their geological formation, and as heretofore intimated, have three distinct portions: 1st, the pliocene and miocene tertiary; 2d, the cretaceous, and 3d, the lignite tertiary.

The *first section* extends from the southern boundary north, nearly continuous to the 44th parallel, and contains a large portion of the valleys of the Platte, Loup Fork, Niobrara and White Rivers. Here, except in the immediate valleys of the streams, which are composed of good soil naturally irrigated by springs from the bluffs or susceptible of irrigation, much of the country is sandy and unfit for cultivation. No valuable mineral or good building stone have been discovered in it. Here are to be found the Sand Hills, which occupy an area north of the Platte of not less than 20,000 square miles. These hills on the north begin between the White and Niobrara Rivers, and extend south probably beyond the Arkansas. Their height, so far as ascertained, varies from 10 to 200 feet, and in the western portion they are ranged in ridges running east and west; but in traveling they are frequently crossed, as the intermediate valleys, which are also sand, are not continuous. About the sources of Loup Fork, many of the lakes of water found in them, are impregnated with salts and unfit to drink. The present form of these hills is mainly, if not entirely due to the wind. Where grass protects the surface the sand does not drift; but if this is removed, the wind whirls the sand in the air and often excavates deep

holes. Thus it would appear that no road could be carried through this part of the territory; for should any attempt be made to grade the surface, the drifting sand would soon fill up the cuts. In this section is also to be found the *Mauvaises-Terres*, or *Bad Lands* of White River, so celebrated for their vertebrate remains. The locality to which this name has been applied is in extent about 150 miles long, in a direction northeast and southwest, and about 60 miles wide. The term was given to this section by the traders, on account of the difficulty of getting a road through a portion of it. The name, however, is an improper one to be applied to the whole of the geological formation, to which these *Bad Lands* belong; and ought not to be used except in speaking of the portion occupied by it along the middle course of the White River; and even in this part of the river's course some beautiful valleys are to be found, as beautiful as anywhere in the far west. These Bad Lands of the White River country have frequently been spoken of as a vast grave or sepulchre, from the amount of bones found there; and this figure of speech has somewhat tended to give a gloomy idea of the locality which it does not especially deserve, as it abounds in the most beautiful and varied forms, in endless variety, giving the most striking and pleasing effects of light and shade. It has also been described as a great depression in the plains, with the country rising like steps to the Black Hills; whereas many portions of these Bad Lands are higher than all the country between them and the mountains, from which the portions on White River are distant about 30 miles. The formation to which this portion belongs extends almost uninterruptedly east to the mouth of the Keya Paha, and south beyond the Platte; and an instance of the striking appearance which it sometimes makes, is exhibited in the Court-House Rock and Scott's Bluffs.

The *second section* is the cretaceous formation, forming the level country at the base of the Black Hills; the valley of the Shyenne River, and the immediate valley of the Missouri River,

from Heart River to the Big Sioux. In this section the soil is clayey; and wherever there is a sufficiency of rain, or streams, to irrigate the soil, it is productive. The great drawback to its fertility is a want of timely rains. A portion of this formation from the Big Bend to the South Shyenne is composed of black shale, and contains much saline matter, which renders the water in some places unhealthy, and adds to the sterility of the soil along the bluffs of the streams, where saline springs are common. In this section, too, there are no valuable minerals or good building stone, except that furnished by boulders.

The *third section*, or lignite tertiary, extends north and west to the British line. The want of rain, which is experienced in this area even more than in the one north of it, renders it nearly barren. Everywhere beds of lignite are to be found, sometimes of a thickness of 6 or 7 feet. The burnt appearance of the earth, along the banks of the streams, shows that in former times these beds have been on fire over large areas, and in places are entirely burnt out; and those on Powder River are said to be on fire at the present time. There is, however, every reason to believe that in places this lignite will be found of quality good enough for fuel. In this section boulders furnish the only good building stone; but here, as in all other parts of Nebraska, good clay for making brick can be found.

The carboniferous formation is developed in a small part of the south eastern portion of the prairie of Nebraska. The town of De Soto is the highest point known on the Missouri where limestone is exposed. Ascending the valley of the Platte it is found quite well developed as far as the north of the Elk Horn, where it passes beneath the bed of the river, and become overlaid with sandstone. Several small seams of coal have been found in these limestones at Bellevue and elsewhere, and in the valley of the Platte; but it is evident that though these limestones belong to the true coal measures, they hold a position above the valuable beds; nor is it probable that a single valuable seam

will be found north of the Kansas line. The coal wrought near Fort Leavenworth, in the Kansas Territory, holds a lower geological position than the limestones of southern Nebraska. The seam of very inferior lignite, near Sioux City in the cretaceous rocks, may possibly in some places furnish fuel of value, but when exposed it gives little promise of such a result. In this case, however, as well as the coal seams in the Platte, it may be, that on penetrating to the interior portions of those beds, they will improve in quality.

The section of Nebraska which is now being occupied by settlers, has fertile soil, not surpassed by any portion of the prairies of the Mississippi Valley. In this eastern section are found the fertile and wooded valley of the Elk Horn, and all the wooded parts of the Platte. In the southern portion of it good building stone is furnished by the carboniferous rocks.

After passing to the west of the 97th meridian, sandy tracts are met with, especially near the 42d parallel, upon which they have their greatest eastern extension. It is not to be assumed, however, that there are no good lands west of the meridian of 92°, for there are fertile tracts as far west as the 99th upon the borders of streams, and which contain wood enough to support settlements. But beyond this, to the mountains, the settler will have to depend for subsistence on his flocks and herds as the Indian now does on the buffalo. Good grass is generally found all over the plains, varying in quantity and quality with different localities. In this particular the plains of Nebraska differ essentially from the desert country on Green and Snake rivers west of the South Pass, where even a sufficiency of grass for animals cannot be found.

A very different condition of soil, water and building material of stone and wood exists on reaching the mountain region.

The Black Hills, or, more properly, mountains lying between the forks of the Shyenne on the 44th parallel, between the 103d and 105th meridians, cover an area of 6,000 square miles. Their bases are elevated from 2,500 to 3,500

feet, and the highest peaks are about 6,700 feet above the ocean. The different rocks composing these mountains are—

1. Metamorphosed azoic rock, including granite.
2. Lower Silurian, or Potsdam sandstone.
3. Devonian.
4. Carboniferous.
5. Permian.
6. Jurassic, and
7. Cretaceous.

All the rocks below the Silurian are igneous and metamorphic, and the stratification which they exhibit stands every where nearly vertical, with a strike varying between northeast and northwest. All the rocks, from the Silurian to the close of the cretaceous, apparently lie conformable to each other. The shape of the mass is elliptical, the direction of its major axis being north, about  $20^{\circ}$  west. On the west, the rocks dip as a whole very gently, and at a distance of five miles from the foot of the hills, the cretaceous is apparently undisturbed, though at the base, these rocks stand at an angle of  $45^{\circ}$ . The manner in which this rock lies, suggests the idea that the cretaceous probably forms a considerable portion of the elevated plateau between the Black Hills and Big Horn Mountains. The upheaved rocks form more than one-half the mountain mass, composing some very high ridges. These rocks have a much greater inclination on the east side of the mountains, and soon disappear under the cretaceous, forming a comparatively narrow belt. The east base of the mountains is from 2,000 to 3,000 feet below the western. The rocks seem also to dip much more suddenly on the south than on the north side. The strike of these upheaved strata is in almost every direction corresponding on the exterior nearly with that of the tangent to the outline of the mass, and on the interior more nearly coincident with the direction of the major axis. A result of this formation is, that the upturned rocks break off abruptly on the side towards the interior of the mass, and leave open valleys in many places between this steep slope and the gentle one which succeeds it, as the in-

terior is approached. In these valleys, the best roads are found, and one which nearly encircles the Black Hills, is known among the Indians and traders, as the Race Course, or Running Road.

The Black Mountains derive their name from the dark appearance of the pine forests by which they are covered. The highest masses in the east, at Harney's Peak, are all granitic, and, as seen at a distance, appear in the same unmissable form as those on the Raw Hide and Laramie Peaks; the rocks standing in layers and slabs, indicating a vertical stratification. The Inyan Kara Peak is basaltic, as are also, from distant appearances, the peaks to the north known as the Bear's Lodge and Little Missouri Buttes. More recent volcanic action is visible at Bear's Peak, and two circular spaces to the west of this peak, now occupied by muddy lakes, indicate the existence here, in former times, of volcanic forces.

In these mountain formations, which border the great plains on the west, are to be found beautiful flowing streams, and small rich valleys, covered over with fine grass for hay, and susceptible of cultivation by means of irrigation. Fine timber for fuel and lumber, limestone and good stone for building purposes are here abundant. Gold has been found in places in paying quantities, and, without doubt, the more common and useful minerals will be discovered when more minute examinations are made.

It is exceedingly desirable that something should be done to encourage settlements in the neighborhood of Fort Laramie. The wealth of that country, says Lieut. Warren, is not properly valued. Those who live there now support themselves by trade with the Indians, which being already overdone, it is to their interest to keep others away. If the Indian title were extinguished, and the protection of the territorial government extended, there would soon spring up a settlement that would rival that of the Great Salt Lake. The Laramie river is a beautiful stream, with a fine fertile valley and there are such everywhere

along the base of the mountains. Pine timber of the finest quality is found in abundance, easy of access, and from which the finest lumber can be made; and building stone of good quality abounds. The establishment of the military post at Fort Laramie, and the constant passing of emigrants, have driven away the game, so that the Indians do not set a high value on the land, and it could be easily procured from them.

The people now on the extreme frontiers of Nebraska are near the western limits of the fertile portions of the prairie lands, and a desert space separates them from the fertile and desirable region in the western mountains. They are, as it were, on the shore of the sea, up to which population and agriculture may advance and no further. But this gives them much of the value of places along the Atlantic frontier, in view of the future settlements to be formed in the mountains, between which, and the present frontier, a most valuable trade would spring up. The western frontier has hitherto and always will be looking to the east for a market; but as soon as the wave of emigration has passed over the desert portion of the plains, to which the discoveries of gold have already given an impetus, then will the present frontier of Kansas and Nebraska become the starting point for all the products of the Mississippi Valley which the population of the mountains will require. The beneficent operations of this trade are foreshadowed in the Santa Fe trade now carried on from the western border of Missouri; and still more plainly in the impetus given to Leavenworth by its being the depot for the supply of the army in Utah. This flow of products has in the last instance been only in one direction, but when those mountains become settled, as they eventually must be, then there will be a reciprocal trade materially beneficial to both.

These settlements in the mountains can never be agricultural to the same extent as those of the Mississippi Valley, but must depend greatly upon the raising of stock. The country, however, furnishes the means of raising sufficient quantities of grain and vegetables for the use

of the inhabitants, and beautiful, healthy and desirable locations for their homes. The remarkable freedom here from sickness is one of the attractive features of the region, and will in this respect go far to recompense the settler from the more fertile valley for his loss, in the smaller amount of products that can be taken from the soil. The great want of suitable building material, which now so seriously retards the growth of the west, will not be felt in this region.

How far the fine timbers in the interior of Nebraska can be relied upon to supply settlements on the Missouri is a question as yet undecided. The pine extends along the Niobrara and its side ravines for about 120 miles, and there is nearly an equal extent of it on White River; but on both streams it is of inferior quality and difficult of access. That at the Black Hills is much better, and covers an area of about 1,500 square miles; but this is also in situations where much labor would be required in getting it out, and an Indian war would probably attend the first attempts to do so. The Niobrara, White and Shyenne rivers could be used to bring the logs to the Missouri, down which they could be rafted.

With regard to the climate of Nebraska a true indication is to be found in the character of the plants which flourish within its limits. Certain kinds, unable to survive the long periods of drought which occur, though appropriate to the latitude, are rarely to be seen, and those which flourish best are such as require little moisture, or whose roots, penetrating deep into the soil, enable them to draw a sufficiency of moisture from below. In the high prairies, where there is a good soil, the bunch grass abounds, but in many places is interspersed with patches of *cacti*. The bottom lands of many of the streams support no trees, except the cottonwood and willow, and some of them produce rank growths of the wild sage.

The absence of trees on all the prairie regions is another evidence of the dryness of the climate, and even in places where they are formed, as in the ravines, the excessive cold of the win-

ter winds prevents them from reaching their full development, as is proved by the dead tops of nearly all the trees which extend their branches above the level of the prairie. The prairie fires have indeed done much towards preventing the growth of trees in places adapted to them, but it is not a sufficient cause to account for the general absence of forests.

An interesting instance of the effect of the climate in the growth of trees is to be seen in the cedar, on ascending the Missouri. At the first Cedar Island, in lat.  $43^{\circ}$ , these trees grow in the bottom lands of the river, and are large and straight; those growing on the bluffs being of an inferior quality. Further up the stream the trees diminish both in size and number. The last considerable clump or grove is in the bluffs, opposite the mouth of the Little Shyenne, in about lat.  $45^{\circ}$ ; and here they are exceedingly crooked and twisted. Along the Missouri and Yellow Stone, in the lignite tertiary formation, we find the cedar unable to support itself above the ground, and spreading itself over the surface, presents the appearance, on the hill sides, of grass or moss.

Grass is everywhere abundant. With regard to corn, a small variety is raised by the *Man-dans*, *Rees* and *Gros-Ventres*, near the 47th parallel on the Missouri; and it is probable that this corn can be raised along the base of the mountains as far north as the 46th parallel. The entire mountain section will produce good wheat, where the land can be irrigated; and the abundance of grass for pasture will permit of the raising of immense herds of cattle. This western portion of Nebraska may, therefore, in the future, be valuable for a people partly engaged in agriculture, but relying mainly upon the raising of stock.

Of the rivers of the Territory, the Missouri claims first attention. This great stream has generally an uniform width from the junction of the Yellow Stone to its mouth, varying from a third to half a mile, when the banks are full. In low water the width is much less, and dry bars of sand occupy portions of its bed. In the upper part of the river, where the trees do not

destroy the force of the wind, the sand is blown about in a surprising manner, and the clouds of it can be seen for many miles. Sand banks are thus formed, generally at the edges of the trees on the islands and points, and which are often raised many feet above the level of the highest floods. The force of these winds, and their constancy during certain months, especially in October, are of themselves one of the greatest obstacles to the navigation of the river.

The navigable qualities of the river are pretty uniform from the mountains to its mouth; the difference being a little more depth of water below James' River. Along the banks, the bluffs are generally clothed with various species of trees as far up as the mouth of the Platte; above which the timber is usually confined to the ravines and bottom lands. These bottoms attain a width of from 10 to 15 miles at Council Bluffs. This width is almost continuous to the mouth of James' River. Throughout this section, the edges of the banks are lined with heavy cottonwood and other trees, and fuel for steamboats is cheap and abundant. At James' River the bluffs approach so closely, that the general width of the space between is only from one to two miles all the way to the upper Big Bend, near the 48th parallel. Here again the bottom lands become wider, and preserve a width of from 3 to 6 miles, to a point about 50 miles above the Yellow Stone. In this section there is also an abundance of large cottonwood timber, and the appearance of the river is quite similar to that presented at Sioux City. The portion of the river most deficient in wood is that between the mouths of the Little Shyenne and Cannon Ball rivers; but even here, there is an abundance for the purposes of navigation for years to come.

Another great obstruction to navigation, is the great number of *snags*, or trees, whose roots, imbedded in the channel, stand at various inclinations down the stream. These obstructions are comparatively rare above the mouth of James' River, but from this point down, they are so extremely numerous that boats are compelled to lay up, during the night, and thus

occasion a loss of nearly one-half of their running time. These and adverse winds delay steamers for days. The effect of the wind is much more seriously felt above Council Bluffs, for the protection afforded by the trees on the banks is less, and is constantly diminishing.

The examinations of Lieut. W.'s party extended only sixty miles above the Yellow Stone. The portion of the river above that point, however, was thoroughly examined by Gov. Stevens in 1853. From these examinations it has been ascertained that the river is navigable in its best stages for light draught boats to Fort Benton, about 2,600 miles from its mouth, and it is the opinion of Lt. W. that notwithstanding the difficulties to navigation which exist, that the Missouri is superior to any river in this country, except that portion of the Mississippi below their junction. The navigation is generally closed, by ice, at Sioux City, by the 10th November, and at Fort Leavenworth by the 1st December. The rainy season commences in different years, between May 15th and June 30th, and lasts about two months. During this period the tributaries of the Missouri maintain it in good boating stage. The flows produced by the melting snows come from the Platte, Big Shyenne, Yellow Stone, and the Missouri above the Yellow Stone, and reach the lower river about the first part of July, and it is mainly to these that the navigation of the Missouri above the Niobrara depends.

The American Fur Company's boats are of the largest class of freight boats now navigating the Missouri. They carry from 150 to 200 tons to the Yellow Stone, 1,900 miles, drawing from 3 to  $3\frac{1}{2}$  feet of water, and making the passage up in from 22 to 35 days. Considerable freight is taken out for the post of Fort Union, and they generally ascend with the portion destined for Fort Benton, to about 60 miles above the Yellow Stone, and have on one occasion gone to Milk River, 100 miles further. The freight is now taken on board of Mackinac boats, and corded by hand, aided generally by sails. These boats are from 60 to 70 feet long, drawing 15 to 18 inches, but 20 to 24

inches could be used. The time from Fort Union to Fort Benton varies from 40 to 80 days, depending on various causes, of which the wind is the most important. The river distance from Milk River to Fort Benton is 500 miles.

The Yellow Stone enters the Missouri near Fort Union. For the first hundred miles above its mouth the bottom lands are nearly all on the left bank; and the first 40 miles, are from 4 to 5 miles wide, with beautiful, soft, rounded bluffs to the west. The banks are clothed with large cottonwood trees, and the country presents one of the finest locations for a military post, and an Indian reservation, anywhere to be found. Beyond, the bluffs on the left bound the approach almost to the water's edge, the bottoms are narrowed, and the timber smaller and more scanty. A good route for wagons, however, exists on this side for 100 miles above the mouth. Beyond this point, the route becomes obstructed by impracticable bluffs, barely permitting the passage of pack mules. To pass around them with wagons without crossing the Yellow Stone, a detour has to be made into the prairie, consuming one or two days. Bluffs similar to these exist on the right bank all the way from the mouth to this point, but here the river suddenly changes its position in the valley, so as to leave the open space on the right bank.

This point is also the highest in the reach of navigation for steamboats, and those even of very light draught cannot, except at high water, ascend higher than 50 miles from its mouth, as the channel is much cut up by wooded islands, and obstructed by sand bars. At the head of steam navigation, ledges of rock show themselves in the bed of the streams, and about one-half mile below Powder River, a dangerous rapid, called by Captain Clarke, *Wolf Rapid*, is encountered. Two miles above the Powder River, Captain Clarke describes another serious interruption, in Bear Rapid, and 20 miles above this another which he calls Buffalo Shoal, "the most difficult part of the Yellow Stone River." All these rapids are passed every year by the

Mackinac boats of the Fur Company on their way to Fort Alexander Sarpy, and there are probably no obstacles sufficient to prevent them from reaching the point where this river debouches from the mountains. The valley all the way to the mountains is said to be practicable for wagons. Above this point the river is much enclosed by mountains, which are rugged and difficult, and covered with pine forests. From Fort Union to Fort Alexander Sarpy, the boats are from 50 to 60 feet long, drawing 15 to 20 inches water, and make the distance, 225 miles, in from 15 to 30 days.

None of the tributaries of the Yellow Stone, (Clark's Fork, Big Horn, Tongue, and Powder Rivers,) above their mouths, have ever been visited, except by trappers and hunters. Big Horn is the most important of these, and has been navigated by traders in skin boats, carrying peltries from the point where it debouches from the Big Horn Mountains, to the main river, a distance of perhaps 150 miles. Powder River rises near the southern point of the same mountains, and flows a little east of north. A route from the Platte, (at Red Buttes,) to the Yellow Stone along the stream is practicable; but, as a route for wagons, it is difficult, requiring the stream to be frequently crossed. Its banks are very muddy, and the bed in places is quicksand.

The Little Missouri River rises in the northern part of the upheaved stratified rocks of the Black Hills, and has a general northeast course through the great lignite region, to the Missouri. Sir G. Gore's party traveled up this river in 1856, and hence it is inferred that a wagon route along its border is practicable, though it may be difficult. The valley is one of the great buffalo regions. The Knife Heart, Cannon Ball, Grand and Moreau rivers all rise in the prairie ridge, east of the Little Missouri, but contain little water, except in the rainy season. The Big Shyenne is an important stream, and has its extreme sources west of the Black Hills, which its two main constituents enclose. These are supplied by numerous streams from the mountains, and unite in long,

$102^{\circ} 20'$ , the river reaching the Missouri in lat.  $44^{\circ} 48'$ . In its lower course there is fertile land on its banks, and also to a large extent in and around the Black Hills. Lumber can, probably, be floated down this river, and the streams that flow into it. The Missouri, at the mouth of the Shyenne, is in the centre of the Dakota country, and along its valley we have the shortest and best route by which to reach their strongholds. Bad River, (Wakpa Spicha, or Teton,) receives its name from the unpalatableness of its waters in low stages, and the difficulty of traveling along it in wet weather. It lies throughout in the black shale bed of the cretaceous formation. It is along the sources of its northern tributary that the road from Fort Pierre to Fort Laramie is located. White River, (Mankisita Wakpa) has generally an open, well-wooded valley, with a fine soil and luxuriant grass. The road between Forts Laramie and Pierre follows the valley from its source to the Bad Lands, where the river enters a difficult section, bounded with precipices, like those on the Niobrara. The Bad Lands extend continuously down the stream to the South Fork, a distance of about 70 miles. Below this the river winds through a handsome, well-wooded valley to the Missouri. It has numerous branches, the largest of which is the South Fork. The pine in this river is nearly equal in extent to that on the Niobrara. This stream has been used by the traders to float down their peltries by means of skin-boats from their former trading house, near Butte Cache, and can also be used to raft down the pine lumber on the South Fork.

The Niobrara is a river about 350 miles long. From its source, in long.  $103^{\circ} 15'$ , it is a beautiful clear stream, 10 to 15 feet wide, gradually widening, until, in long.  $102^{\circ} 30'$ , it attains a width of 60 to 80 yards. All this distance its valley is well grassed, quite open and easy of travel. Here, however, it enters high steep banks, and for a long way it is a complete canon; but wood now becomes more plentiful, and pine is occasionally seen on the bluffs. In long.  $101^{\circ} 45'$ , the sand hills close in on the

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north bank, while on the south, they are two miles distant, leaving a smooth road to travel along the bluffs. The bluffs gradually appear higher and higher above the stream, as it descends until they reach the height of 300 feet. The sand mostly ceases on the north side in long.  $100^{\circ} 23'$ , but it lies close to the stream in the south, nearly all the way to the Wazihonska. Throughout this section, lying between  $102^{\circ}$  and  $99^{\circ} 20'$ , it flows between high rocky banks of soft white and yellowish calcareous and silicious sandstone, standing often in precipices at the water's edge, its verticality being preserved by a capping of hard grit. It is here impossible to travel any considerable distance along its immediate banks without having frequently to climb the ridges which rise sometimes perpendicularly from the stream. The channel appears to have resulted from a fissure in the earth's crust, and now flows at a depth of 300 feet below the general level, and on approaching it, its existence is only heralded by the trees which overtop the enclosing bluffs. The soft rock, which forms the bluffs, is worn into the most intricate labryntas by the small streams; and in the small deep valleys thus formed, the grass is luxuriant, and pine, ash and oak abundant. To the agriculturist, however, this section has comparatively little attraction. That between long.  $99^{\circ} 20'$  and its mouth, an extent of about 90 miles, is perhaps far more valuable. Here the bottoms will probably average a width of a quarter of a mile, are susceptible of cultivation, and cottonwood, oak, walnut and ash abound. The principal tributaries of Niobrara, (which are described at length by Lt. W.,) are the Turtle Hill River (Keya-Paha Wakpa), the largest, and perhaps 120 miles long; Little Rapid River, (Mini-chaduza-Wakpa,) about 50 miles long, and forming the eastern border of the sand hills, and a number of minor streams from the northwest. Entering from the south, streams are numerous, but only three of any size, being at most only 25 miles long. The bluffs along nearly all of these are well wooded. The Ponka River, which has a very fine, well wooded, and fertile

valley, runs into the Missouri, about five miles north of the Niobrara, in lat.  $42^{\circ} 48'$ .

The Platte, or Nebraska, is the most important tributary of the Missouri in the region under consideration, and its broad and grass covered valley, leading to the west, furnishes one of the best wagon roads of its length in America. From its mouth to the forks the bluffs are from two to five miles from the water, making an intermediate bottom of from 4 to 8 miles wide. From the forks to Fort Laramie they occasionally come down to the water's edge, and the road has to cross the points of the ridges, and from Ash Hollow to the Fort the road is sometimes heavy with sand. Fine cottonwood grows along the banks, and on the islands from the mouth to Fort Kearny, but higher up it is scarce and of small size. Cedar is found in the ravines of the bluffs at the forks and above. The river is about a mile wide, and flows over a sandy bottom. When the banks are full, it is about 6 feet deep throughout, having a remarkable level bed; but it is of no use to navigation as the bed is so broad that water seldom attains sufficient depth, and then the rise is of short duration.

The streams of the prairies of Nebraska, below the Yellow Stone, flowing into the Missouri, are none of them navigable to any reliable extent; and, as most of them run from west to east, their greatest practical value is in affording the land route of communication between the two great sections of the Union. These valleys, indeed, furnish the only routes by which to traverse the intervening desert, for here only are such supplies of water to be found as are required, and here, too, is the only soil that can be cultivated, and such scanty supply of wood as the region produces.

Of all these river valleys, that of the Platte undoubtedly furnishes the best route for any kind of road, westward; and the best point of starting is the vicinity of Omaha City. An appropriation of \$50,000 has already been expended in bridges, etc., on the eastern portion of it, and the only important improvement remaining to make it far superior to any route on

the south side of the Platte is the establishment of a good crossing at Loup Fork, either by bridge or ferry, both of which are difficult: the first on account of the width of the stream (1,000 yards), and the latter on account of the shoals and shifting sand bars. The ford is bad by reason of quicksands. No improvement in the west would be of greater value to the emigrant or to military operations; and this once done, the route would not only be the shortest, in this latitude, from the Missouri to the mountains, but would not throughout have a serious obstacle all the way to the South Pass. Any route that takes the south side of the river has the South Fork, (which is as difficult a stream as Loup Fork,) to cross at a point where bridging it or establishing a ferry is as this time impracticable. The value of Omaha City as a starting point, as before recommended, is predicated on the improvements being made of the crossing of Loup Fork. At present Nebraska City is a point presenting almost as short a road. A considerable distance of river transportation would also be saved to stores brought from St. Louis, by selecting Nebraska City; and besides, this city must always be a superior point from which to supply Fort Kearny. The distance from Nebraska City to Fort Laramie, by the proposed improved route, is about 525 miles; from Fort Leavenworth to the same point it is 645 miles.

The first place which apparently offers a superior route to the last named is the neighborhood of Fort Randall. The distance to Fort Laramie is about 380 miles. There are two reasons, however, why this advantage in distance is not practically attainable—first, Fort Randall as a depot for supplies is not to be compared with Nebraska City; and, second, the greater difficulties of the route from Fort Randall west. That it is practicable to take wagons along the Niobrara has been already shown. The route east to Sioux City might be used for the hauling of supplies from the settlements of Iowa. This route, and that by the Niobrara, would indeed seem to be the most direct one by which to continue the mili-

tary road from Mendota to the mouth of the Big Sioux, and westward to the South Pass. But the great difficulties of the Niobrara route, and the impracticability of any between it and the Platte, determined Lt. W. to advise its location direct from Sioux City to the mouth of Loup Fork, and the road this way, and thence along the Platte Valley, will be only about 40 miles longer than by the way of the Niobrara.

The next point on the Missouri which claims attention, as one from which to supply Fort Laramie, is the vicinity of old Fort Lookout. A route from this point should keep north of the White River, and intersect the present road from Fort Pierre to Fort Laramie. Except for about 30 miles through the Bad Lands, the line is excellent, and, with little improvement, would be equal to the corresponding part of the Fort Pierre and Laramie route.

The route west of this would then be the excellent one along the White Valley, at the head of which, however, there is a difficult section of about 12 miles, which needs considerable improvement. This route would be about 360 miles long, and deserves especial consideration as being the proper continuation of the route located between the Missouri and Fort Ripley, with the design of being continued to the South Pass.

The route from Fort Pierre to Fort Laramie is one that has long been in use, and is about 323 miles long. As settlement advances up the Missouri and Nebraska, and Iowa and Dakota become populated, this route or the one starting from Fort Lookout will claim attention.

At Fort Pierre the navigable portion of the Missouri is at its nearest point to Laramie and the South Pass, and above it, of course, there are no competing routes for supplying this section. Neither does the nearest navigable point for steamboats on the Yellow Stone, or its tributaries, offer any route, the shorter length of which would compensate for the increased river transportation.

In considering of the best routes for supplying the interior, the present wants of the country have alone been kept in view. When the

habitable portions of Nebraska become occupied, other routes will become important from causes not now operating, and that cannot be foreseen; but, nevertheless, those which are now most important will still maintain the ascendancy from the effect of natural causes, and the structure of the country. The same routes now most used, and best adapted to the wants of military occupation, were long before used by the trader, the Indian and the buffalo, as best adapted to their wants; and when future requirements shall demand increased facilities, and railroads shall be built, then they too will be found near the main routes now traveled by the trains of the emigrant and the army.

As before stated, an irreclaimable desert of 200 to 400 miles in width separates the points capable of settlement in the east from those on the mountains in the west. Without doubt these mountain regions will yet be inhabited by civilized men, and the communication with the east will require railroads independent of an interior overland route to the Pacific. For this purpose the valley of the Platte offers a route not surpassed for natural gradients in the world, and very little more is to be done west of the Missouri than to make the superstructure. A cheap road for light trains and engines could easily be built, and when settlements are formed in the mountains such will become profitable; and the gold that has been discovered there in valuable quantities may produce this result much sooner than is anticipated. The Niobrara apparently presents the shortest and more direct route for such a road, than the Platte, but, as before stated, its natural features are less favorable. Nevertheless, the Niobrara route is not impracticable, but the difficulties in the way will overbalance the advantages it possesses in being the shorter route from the Missouri. If the route be considered as starting at Chicago, thence *via* Rock Island, Omaha and the Platte Valley, the distance is about the same as that by Dubuque, Sioux City, and the Niobrara, the one large bend which the Platte route makes at Fort Kearney being counterbalanced by the number of smaller ones of the

Niobrara route. A route for a railroad to the Pacific, from the neighborhood of St. Paul by way of the South Pass, would keep on, or near, the general course of the wagon road lately laid out to the Missouri at Fort Lookout, and thence along the north side of White River, as before indicated.

Should a route ever be required from the west shore of Lake Superior to the South Pass, it could be located on a very direct and practicable line, *via* Fort Ripley, Lake Traverse, and the Big Shyenne, and deserves examination.

But a route from Lake Superior to the South Pass would probably not compete with that examined by Gov. Stevens, near the 44th parallel. It may, however, be questionable whether one of equally as many advantages could not be found by preceding directly west from the Bois de Sioux to the Missouri at Fort Clark; thence by way of Knife River to the Yellow Stone, at the mouth of Powder River. The valley of the Yellow Stone thence offers a direct route west to the mountains, where Captain Clark crossed them, and thence near the route he pursued to the Bitter Root Valley. The more direct route would be down the valley of the Salmon River; but the information possessed of this stream indicates its character, through the mountains, to be one involving great difficulties.

The number of Indians within the limits of Nebraska, so far as enumerated by Lieut. W. would appear to be about 40,000. Of these the most numerous are the Dakotas, numbering 24,000; the Crows about 4,800, the Pawnees about 4,000, and the Chippewas, Crees and Assiniboin, about 3,600. The chapter relating to these is full of interest, but too long for insertion, after the extended notice given to the physical and economical features of the country. For the same reason the medical report of Dr. Moffitt, and the report of Dr. Hayden on its geology and natural history, etc., are omitted.

The subject of a railroad to the Pacific, being an abridgement of the explorations made by the government to this end, will form an appropriate continuation of this report.

## RUSSIANS ON THE AMOOR.

The Russian Government has recently promulgated a decree which proves the importance and development which the settlements founded on the Amoor have already attained. These settlements, according to this order, will now be formed into two provinces—the first, or "Maritime Province of Eastern Siberia," to include the six districts of Nicolaersk, Sophusk, Ochersk, Petropolovski, Ghizika and Oudsk, and the second, or "Amoor Province," to include all the country situated on the left bank of that river, from the confluence of the Schilka and Angame up to the confluence of the Oussouri. The latter province will have the city of Blagofestchensk for its capital, which will be the residence of its military governor and the other officials.

That the Russians have developed their Asiatic possessions with a remarkable spirit of intelligence and perseverance is now apparent. The treaty entered into about three years ago with the Court of Pekin, through Gen. Mouravieff Amoorski, has given a fine territory to the nation, and will open to that power the centre of China. The Amoor is formed by the union of the rivers Kheroulun and Onon. The first is considered as the principal constituent of the main stream. It takes its source in the Barkab-Dabahn mountains, and separates the Chinese from the Russian Daouri. After the union of the Onon, it crosses the country of the Mantchoos, and empties itself into a gulf of the Sea of Ochotsk, opposite the island of Tarrakai.

In conformity with the decree now promulgated, the principal divisions of Asiatic Russia are modified in the following manner: Western Siberia includes the governments of Tobolsk and Tomsk and the province of Omsk, and Eastern Siberia the governments of Irkutsk, Ianiseisk, Yakutsk, the Maritime Province, and that of Amoor. The trade with China, which was formerly carried on through Kiakhta, a city on the boundaries of the two empires, will in future take larger proportions and become more profitable.

The settlements on the Amoor are in an ex-

cellent condition. The military organization is perfect: it comprises regular troops and regiments of Cossacks. The maritime force is composed of a division, the ships of which have been specially constructed for the local service they have to perform. That division put in at Cherbourg last summer on its way from Cronstadt to the Chinese seas. As to Blagofestchensk, it has become an important city. The buildings for the accommodation of the officials appointed by the above-mentioned decree are already erected and fit for occupation.

Late news from Hong Kong apprises us of the fact that the Russians have also formed a settlement at Broughton, one of the cities of the Corean Archipelago which is under the sovereignty of China. These several creations prove that the Russian understands the advantage which the leading nations will at some future time derive from their Asiatic possessions.

By the treaties with China, made within the last three years, it was decided that a regular mail should be established by land between Pekin and St. Petersburg. Notwithstanding the difficulties of its fulfilment, that decision did not long remain a dead letter. The Governor-General of Eastern Siberia, Count Mouravieff Amoorski, desiring to watch in person over the organization of that important service, proceeded, about the beginning of November last, to the city of Kiakhta, and despatched the first courier of the new postal line, and notwithstanding the unfavorable weather that then prevailed, he arrived at Pekin on the 20th December. The Chinese Government decided that the courier should remain outside the city, but allowed the mail to be delivered, and announced that the return mail would start in a month's time, and would take charge of the letters for the road, provided that those who were to write them would submit themselves to the imperial regulations on the subject. The Russian mission at Pekin punctually received its despatches, through a Chinese messenger, the day after the arrival of the courier. This is the first step in an important direction.

The mail will hereafter depart and arrive at Kiakhta monthly. The courier who goes from that city to Irkutsh, the capital of Eastern Siberia, will correspond with the courier going thence to St. Petersburg, and the whole trip from the Russian capital to Pekin and the return will, in fine weather, be made in from 78 to 80 days. The advantage of this arrangement will only be made evident when the several nations of Europe will have established official representatives in the Chinese capital, as the late treaties allow them to do.

#### MISSOURI IRON.

In the 1st volume of the Geological Survey of Missouri an estimate is given of the quantity of iron ore in the celebrated iron region of that State. The Iron Mountain, 228 feet high, covering 500 acres, is one mass of specular ore, weighing 230,187,275 tons, and will yield at the furnace 56 per cent, or 128,904,930 tons of pure iron. Pilot Knob, next in richness, is estimated to contain 13,972,773 tons of ore, or 7,824,752 tons of pure iron. These two deposits will furnish 136,729,682 tons of iron, the ore of which all lies above the natural surface of the country, is easy to mine, and furnishes the best of metal. Railroad iron, 70 lbs. to the yard, takes 123.2 tons to the mile, and all the railroads in the United States (30,000 miles) would take of that weight of rail about 3,696,000 tons of iron, or but a little more than a fortieth part of the whole deposit. What gives a present value to these deposits, is their connection, through the St. Louis and Iron Mountain Railroad, with the vast coal fields lying immediately above St. Louis. At that point the ore and coal are brought in contact, rendering St. Louis unsurpassed by any locality in the world for the manufacture of iron.

#### JUNCTION OF THE SEA OF AZOF AND THE CASPIAN.

The project of effecting a junction between the Caspian Sea and the Sea of Azof, says a letter from St. Petersburg, is now the subject of much conversation here, and will soon, it is

thought, be realized. This was a favorite scheme of Peter the Great, whose genius clearly saw the immense advantage which must accrue to Russian commerce, if this great inland sea could be connected with the Sea of Azof, and thereby with the Black Sea and the Mediterranean.

#### NORTHEASTERN BOUNDARY.

The entire length of the boundary line from the source of the river St. Croix to St. Regis, on the St. Lawrence, is 658 miles, 3,145 feet, bounding several State, namely: Maine, 447 miles, 3,753 feet; New Hampshire, 56 miles, 1,503 feet; Vermont, 90 miles, 2,853 feet; and New York, 64 miles, 316 feet. *Exec. Doc., No. 1, 31st Cong., 2d Sess.*

#### HEIGHT OF MOUNT DEMAVEND.

In the Proceedings of the Royal Geographical Society of London, No. 1, 1859, there appears a very interesting paper on an ascent of Mt. Demavend, effected by R. F. Thomson and Lord Schomberg H. Kerr, of H. B. M.'s mission in Persia. These gentlemen have set at rest the much disputed question of its elevation, and give it at 21,520 feet above the sea. Humboldt, in his *Cosmos*, states it to be 19,715 feet; and, according to the same authority, "Ararat" has an elevation of 17,112 feet.

#### HEIGHTS OF BOLIVIAN ANDES.

(From the Map of Col. Juan Ondarza.)

Mountains.	Spanish Feet.*
Yilampu (Sorata)	26,969
Ylimani	26,254
Sajama (Sahama)	24,907
Coololo (Apolobamba)	24,320
Huayna-Potosi	23,785
Chachacomani	23,460
Quenunata, { Tacora }	23,100
Chpicani, { in Peru,	24,660
Mururata	22,194
Sailinsani	22,316
Potosi	17,092
Tunari de Cochabamba	16,966
Hermoso de Aullagas	17,117
Portugalete	16,000
Espejos (in Santa Cruz)	10,149
Misti (Volcano de Arequipa)	21,903

\* Spanish foot=282.65 millimetres, or 11.1283 inches, or 0.9273 English foot.

## DEPARTMENT OF STATISTICS.

## LAKE SUPERIOR COPPER REGION.

Long anterior to the advent of Europeans, the region around Lake Superior had been occupied by an industrious race of miners. The implements of their labors found in their excavations attest the fact; but the record of their history is lost, nor have any traditions or memorials of them been preserved by the races which succeeded.

The Jesuit Fathers in the latter part of the 17th century were the earliest explorers of this region. The first mining operations within historical times were commenced in 1771 by an enterprising Briton, named Henry, at the forks of the Ontonagon; but so distant was he from inhabitants, and so wild and unsettled the country, that he was soon compelled to suspend his labors.

In 1819, General Cass, accompanied by Mr. Schoolcraft, made a journey along the southern shore of the lake to the Mississippi; and in 1823, Major Long passed on the north side on his return from a scientific expedition to the Mississippi and St. Peter's rivers. The publication of the accounts of these expeditions attracted general attention to the mining resources of the region, and established the abundance of copper, confirming fully the reports of voyageurs and trappers who had painted in the most glowing terms the mineral wealth of the region, and which for more than two centuries had excited the wonder and admiration of the civilized world.

The first definite information of this country, however, was that furnished by Douglas Houghton, State Geologist of Michigan, who, in 1841, published an account of his observations in the form of an annual report to the Legislature. This eminent man, while prosecuting further geological explorations, was unfortunately drowned, near the Eagle River, on the 13th of October, 1845. But already mining operations had been re-commenced in the region, and explorers and adventurers were flocking to it from all quarters.

The Chippeways, the Indian occupants of Northern Michigan, ceded their lands to the United States in 1842. The field was thus cleared of all obstacles to agriculture or mining. In the summer of 1843 several miners crossed over the line from Wisconsin and selected numerous mineral tracts. These selections, many of which are now occupied by the most productive mines in the country, (at first three miles square, but afterwards reduced to one mile,) were leased by the War Department to applicants, in virtue of an act of Congress, made in reference to the *lead lands* of Illinois. These leases required that the lessees should work the mines with all diligence, and render to the government six per cent. of the whole amount of the ores and metal raised.

In the season of 1844, it having become generally known that the country was open to settlement, numerous persons visited the region, and the first mining operations were commenced. Discoveries of vast masses of native copper and of veins and deposits in the rock rapidly succeeded each other; and the "copper fever" soon spread to every part of the country. In 1845, the shores of Keweenaw Point were whitened with the tents of emigrants and explorers. No less than 377 leases were issued in this year. In 1846, the excitement reached its climax—companies were formed, stocks bought and sold (many not worth the paper on which they were printed), and the whole community was mad with the expectation of sudden wealth. But every such mania has its end. The bubble at length burst, and at the close of the year scarcely half a dozen companies, of the multitude that had been formed, were actually engaged in mining.

In 1847 (the issue of leases having been suspended in 1846 as unauthorized by law), Congress passed an act for the sale of the mineral lands, and for a geological survey of the district. The latter was entrusted to Messrs. Foster and Whitney, whose elaborate report to Congress, and the subsequent work of Mr. Whitney,\* form the basis of the present ac-

\* "Mineral Wealth of the United States."

count. In the meantime, while the survey was progressing, the companies at work having met with much success, new companies were formed, and the position and character of the really metalliferous rocks having been ascertained, confidence was gradually restored. On the publication of the survey and maps of the whole region in 1851, copper mining in the district had become established on a firm basis, and was receiving a rapid development.

Having thus given a sketch of the progress of events on the shores of the Great Northern lake, it will be proper to add a few words on the geological structure of this region; and the results which have been accomplished.

The basin of Lake Superior occupies for the most part a great synclinal trough. From each side of the lake the dip of the sandstone, which appears to form its bed, is towards the center. The opposite shores, sometimes 160 miles apart, however, are very different in character and appearances—the northern, with cliffs almost perpendicular and sometimes more than 1,000 feet high, presenting scenes of unrivalled grandeur; the southern comparatively low, only occasionally rising to a height exceeding 200 feet above the lake.

This difference in aspect is easily accounted for. On the east and north the sandstone has been worn away, leaving only the enduring granite and trappean rocks, which present a more stable barrier against the further encroachment of the lake. Only here and there limited patches of sedimentary rocks remain, where they are sheltered from the action of the waters, standing as outliers in small islands and along the coast, and behind Isle Royale.

The sandstone, however, appears along the entire southern shore from Sault Ste Marie to Fond du Lac, its continuity being interrupted in only a few points where the older rocks have been denuded. The trend of this shore is east and west; but about mid-distance from its extremities, its outline is broken by a projecting point of land which extends in a north-east direction for 60 or 70 miles. This is Keweenaw Point.

The sandstone of Lake Superior has been satisfactorily proved to be of the lower Silurian age, and probably the equivalent of the Potsdam sandstone, the lowest fossiliferous rock recognized in the United States. Above it from any point between the Sault and the Pictured Rocks, the upper members of the Silurian system crop out in succession, with a slight southerly dip. Along this portion of the lake shore the sandstone lies nearly horizontally, and is made up of rounded grains of quartzose sand, but slightly discolored by iron, and having but little coherence. Its thickness is from 300 to 400 feet. When it comes in contact with the azoic rocks, as near the Carp and Chocolate Rivers, it rests unconformably upon them. On Keweenaw Point, however, its disposition is entirely changed, being thicker, tilted up and associated with heavy beds of conglomerate and trap. On tracing the interior ranges, which approach the lake at the extremity of the Point, they are found to extend southwesterly a few miles distant from the lake, gradually diminishing in Wisconsin, and finally disappearing before reaching the Mississippi River.

These ranges form usually two, but sometimes three or more, parallel ridges, steep towards the south, with a moderate dip lakeward, and averaging about 500 feet in height above the lake. Along the line of elevation locally known as the "*Trap Range*," the copper mines of the southern shore are situated, the metalliferous belt occupying in Michigan a length of more than 120 miles and a breadth varying from two to six miles. In the more elevated and central portion of the range, the rocks are mostly of the igneous class, intercalated with beds of conglomerate. Receding in either direction from the line of igneous action, the belts of trap become thinner, and the conglomerate predominant, and, again, the latter is succeeded by sandstone, with its normal characteristics.

There are certain varieties of trap, which are universally recognized in this region and which have a marked influence on the character of

the veins as they pass through them. These changes of character are most distinctly perceived in Isle Royale and Keweenaw Point. The two species predominant in Keweenaw Point are the amygdaloid and greenstone; only the first of which is productive. The richest veins are found in the rock which is neither too compact nor too soft and porous.

Native copper, for which this region is peculiarly noted, occurs in many veins, but usually in small masses which are found near the surface and have evidently resulted from the decomposition of the sulphurites. The veins of those rocks in which they are most productive carry exclusively native copper, with a small admixture of native silver, and there has been no change observed in this characteristic at any depth as yet reached. Where the trap is not distinctly bedded, it ceases to bear native metal, but contains sulphuret of copper, zinc, lead, etc. Thus in the southern range of Keweenaw Point, which appears to have been protruded at a late epoch, and to have tilted up the bedded trap and interstratified conglomerate which lies to the north, the veins bear only sulphuret, and on the north shore, where trap is most developed, they seem to be of the same imbedded character, and are traversed by the same minerals.

There are three heads under which the miners class the mineral produced, viz.: *mass*, *barrel* and *stamp*, according to the size of the pieces in which it occurs. These distinctions are also recognized in commerce. "Mass copper" is met with in veins sometimes 20 or 30 feet long; and this, having been detached by stoping away the rock, is cut up by chisels into pieces of such size that they can be conveniently handled and raised to the surface. As prepared for shipment the mass copper usually contains from 70 to 80 per cent. of fine metal and sometimes is wholly free from foreign matter, yielding from 90 to 95 per cent. when melted down in the furnace. "Barrel copper" includes the smaller pieces weighing usually a few pounds which are too large to go under the stamps and too small to be shipped loose.

When cleaned the usual yield of "barrel" is from 60 to 70 per cent. of metal. "Stamp copper" forms a large part of all the veins. The ore is prepared to go under the heads by being calcined and broken into small fragments; and when this roasting process is completed, it is ready for shipment. Care has to be taken that the heat is so regulated that no part of the metal is fused.

The Lake Superior mineral region naturally divides itself into four districts, each characterized by its geographical position, and by the mode of the occurrence of its minerals. These are—

1. Keweenaw Point District.
2. Portage Lake District.
3. Ontonagon District, and
4. Isle Royal District.

In this order the several districts will be described in the narrative which follows:

The *Keweenaw Point District* embraces a large number of mines, some extensively worked, and extends over a space of 36 miles in length and from two to three miles in breadth. Its geological features are strongly marked. The metaliferous trap extends through it east and west, and there are through nearly its whole extent two well defined ranges, known as the *Greenstone Range*, and the *Bohemian* or *Southern Range*. The former comprises a line of bluffs rising sharply from the valleys of Eagle and Montreal rivers, which drain the district and flow in opposite directions. The Greenstone Range is made up of compact crystalline trappean rocks. Its northern limits are not sharply defined, but southward, between this and the next inferior bed, there is a stratum of conglomerate accompanied by a thin deposit which seems to be a consolidated volcanic ash, and beneath these lies the great southern metaliferous belt. The bed of conglomerate, which, at the eastern end of the Point, is from 30 to 40 feet thick, gradually thins out, and finally disappears, while the crystalline and amygdaloid rocks remain as well defined as before. The bed between the conglomerate and greenstone often contains thin sheets and particles of copper, and the conglomerate itself is not without

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frequent indications of the same metal. To the south of this belt of conglomerate, the amygdaloid extends from two to three miles, occupying the low grounds of the Eagle and Montreal valleys. On the north the greenstone occupies a width on the surface of a quarter to half a mile, and gradually becomes less crystalline and compact. At length, by an imperceptible change, the rock is found to have become amygdaloid, resembling that on the other side of the conglomerate. From the point where this change occurs, to the first belt of sandstone, is a space of a mile or more which is occupied by a variety of trappean beds, some of which are more or less metaliferous; but together they constitute the "northern metaliferous amygdaloid belt," in which several important mines are worked. Still further to the north is a series of alternating belts of amygdaloid and sandstone, varying from 50 to 500 feet in thickness, and these are again succeeded by a heavy belt of conglomerate which occupies an extent on the surface of nearly a mile. Beyond is still another bed of amygdaloid rock of about 1,500 feet in thickness, succeeded again by conglomerate, which forms the northern portion of the Point from its extremity to Agate Harbor.

The mines of Keweenaw Point, almost without exception, are worked on metaliferous deposits, which have all the characteristics of true veins. They cross the belts of rock nearly at right angles to the strike of the formation, and have in many instances been bored through both the igneous and aqueous formations from the southern amygdaloid belt across the greenstone, the northern metaliferous beds, and the alternating sandstone and conglomerate, to the lake shore. It has not yet, however, been ascertained that the same veins extend across the southern range, and there bear sulphurates. It seems probable, nevertheless, that such is the fact. In their passage through the different rocks the veins exhibit marked changes. In the conglomerate their *gangues* are mostly calcareous, and the copper usually concentrated into large masses, and in one instance black oxide has been found in this rock. In the true

copper-bearing rock the veins appear with a gangue made up of quartzose matter mixed with calcareous spar and the zeolitic minerals. The width of the productive veins is usually from a foot to three feet, but rarely hold these dimensions for a considerable distance. The wider the vein, however, the richer are its metallic contents. In all the district few faults interrupt the continuity of the series in the older rocks. The general parallelism of the productive bodies indeed is remarkable, and they do not have any tendency to unite with one another to form what the Cornish miners call "champion lodes." The dip of most of the veins is nearly perpendicular, no deviation of more than 8° or 10° occurring anywhere. The selvages are well marked, being separated from the wall-rock by a thin layer of red clay or flucan, and the walls themselves striated and polished.

The principal shipping places of Keweenaw Point District are Copper Harbor, Agate Harbor, Grand Marais Harbor, Eagle Harbor, Cat Harbor, Eagle River, etc., all on the south shore of Lake Superior, and in line from east to west.

The following table exhibits the locations of the principal companies preparing for, and that have been or are engaged in mining on the Point:

Titles Companies.	T.	R.	S.	No. of Shares.	Chief Offices.
Central.....	58	31	23	20,000	Pittsburg.
Clark.....	58	28	8	20,000	Montreal.
Connecticut.....	58	30	16	10,000	New Haven.
Copper Falls.....	58	31	14	10,000	Boston.
Eagle River .....	58	31	29	10,000	Pittsburg.
Fulton.....	57	32	33	20,000	New York.
Garden City .....	58	31	28	20,000	Chicago.
Meadow.....	58	31	20	—	—
Montreal.....	58	29	17	20,000	Montreal.
Native Copper.....	58	30	10	10,000	Pittsburg.
New York and Michigan.....	58	28	12	—	—
North American.....	57	32	2	10,000	Pittsburg.
Northwest.....	58	30	15	10,000	Philadelphia.
Northwestern.....	58	31	24	9,000	Pittsburg.
Pittsburg and Boston.....	58	32	36	6,000	Pittsburg.
Phenix.....	58	31	19	10,000	Boston.
Star.....	58	28	9	10,000	Cleveland.
Summit.....	58	30	19	15,000	Pittsburg.

—Of these Copper Falls, North American

Northwest, Northwestern, Pittsburg and Boston, and Phoenix Companies, have either been successful or have fair promises of ultimate success; and in the following table are presented the approximate results of each: (in the amount of mass, barrel and stamp rock reduced to fine copper), and given in tons of 2,000 pounds from the commencement of operations to the end of the year 1858:

Year.	Copper Falls.	North American.	North West.	North Western.	Pittsburg & Boston.	Phoenix Mines.	Total of all Workings.
1845....	..				9.9	..	11.3
1846....	..				18.9	..	25.3
1847....	227	..	..	..	45	..	236.7
1848....	113	..	..	..	500.4	..	512.3
1849....	113	25	16.2	..	643.6	..	544.4
1850....	11.3	85.6	97.8	..	368.9	..	661.9
1851....	2.2	—	147.2	..	425.1	..	598.6
1852....	6.3	87.4	147.2	..	7.9	..	1076.6
1853....	25.6	135.9	4.7	416.6	..	..	1692.4
1854....	46.1	126.3	24.2	563.8	1.7	..	863.6
1855....	51.2	161.3	112.7	32.0	2.0	..	117.92
1856....	69.5	196.7	103.4	61.4	937.1	3.4	1411.2
1857....	..	..	..	..	1110.8	..	1683.9
1858....	206.1	25.4	109.7	..	1068.9	..	1707.6
Total.. ..	..	..	..	..	1256.7	33.8	..
	8167.5	..	..	..	..	..	..

From the above table, then it appears that since the commencement of operations the mines of this district have yielded a total of 11,739,2 tons of fine copper. The value of this amount, estimated at the average of \$500 per ton, gives a cash equivalent of \$5,869,600.

Beyond the 32d range, in which are situated the Fulton, North American, and Pittsburg and Boston (or as the latter is commonly termed the "Cliff") mines, the distinction between the crystalline trap or greenstone, and the amygdaloid, which is so conspicuous a feature in Keweenaw Point, can no longer be traced. A marked change indeed takes place in the metaliferous deposits within a few miles.

and the mines of Portage Lake, which are next in geographical order being only about twelve miles distant, are quite different from those which have hitherto been described.

The "Portage Lake District" was mined as early as 1846, but it was not before 1852 that general attention was directed to its resources. The metal is here found not so much in regular veins as in other districts; but is disseminated mostly in small masses through certain metallic-ferous beds which run with the formation and differ very slightly in composition from the other trappan beds with which they are associated. These beds are neither broken up nor deranged in their course, and their metallic-ferous contents are more uniformly distributed through them than on the Ontonagon. In some instances the same bed has been distinctly traced for a mile or more by a line of ancient excavations, and wherever opened is found to contain copper disseminated through it. There are now at work in this region the following several companies:

Titles of Companies.	Locations.	No. of Shares.	Chief Offices
	T. R. S.		
Albion .....	.55	24	36
Franklin .....	.55	34	34
Huron .....	.54	34	2
Isle Royale .....	.54	34	1
Pewabic .....	.55	34	32
Portage .....	.54	34	36
Quincy .....	.55	34	26
Ripley .....	.55	33	30
Sheldon .....	.55	34	36

The following table gives the results of the operations of these companies, exhibiting, year by year, the yield of the most productive:

Year.	Isle Royale	Pewabic Mine	Portage Mine	Quincy Mine	Total Workings
1853	9.4	..	3.3	..	12.7
1854	18.8	..	5.6	..	24.4
1855	163.4	11.7	28.7	6.8	226.9
1856	119.6	71.4	47.3	17.0	305.3
1857	162.2	146.8	82.7	75.4	495.4
1858	235.4	225.6	?	198.5	754.6
Total	708.8	455.5	..	297.7	1,822.4

In 1858 the Franklin yielded 61.3 tons and the Huron 33.8.

Probably 10 per cent. may be added to the aggregate above shown, which would include

the amounts taken from the mines previous to any regular returns being made, (1846-1853), and also the amounts taken from the few mines which have been omitted in the list. This would give a total from the region of 2004.6 tons, which valued at \$500 per ton, would be worth in cash, \$1,002,300.

The "Ontonagon Region" takes its name from the principal river by which it is drained. This stream has three branches flowing respectively from the east, south and west, and uniting nearly at the same point, they cross the trap range at right angles to its course, furnishing a tolerable means of communication between the mines and the lake. The mines are situated on the trap range, and are worked on both sides of the river for a distance of 12 to 15 miles. Between these mines and those of Portage Lake, the interval is about 25 miles, and in all that distance there are few, if any, open workings. The trap range in that part of its course is much broken into small knobs, and is almost entirely concealed by drift. To the west the limits of the really valuable part of the range are not yet defined.

There is considerable difference both in the character of the rocks and the mode of occurrence of the cupriferous deposits when compared with those of Portage Lake and Keweenaw Point. The trappian rock is more developed, and epidote becomes a frequent associate both of the rock and the veins, almost always occurring where copper is found. West of the Ontonagon a large part is made up of a large reddish quartzose porphyry, which is non-metaliferous; and intercalated in the trap are frequent beds of conglomerate which are usually quite thin, and to the north, the trap range is flanked as in Keweenaw Point, by heavy beds of this rock. The copper occurs in four forms of deposit—indiscriminately scattered through beds of trap; in contact deposits, between the trap and sandstone or conglomerate; in seams or courses parallel with the bedding of the rocks, and having the nature of segregated veins; and in true veins coinciding in direction with the beds of rock, but dipping at a

different, and usually a greater angle, in the same direction with the formation.

The principal mines of the Ontonagon Region, with location, etc., are enumerated in the following tabular form:

	Companies.	T.	R.	S.	Locations. Shs.	No. of Offices.
Adventure.....	51	38	35	10,000	Pittsburg.	
Algoma.....	51	37	30	20,000	Cleveland	
Aztec.....	51	37	31	....	Pittsburg.	
Bohemian.....	51	38	34	20,000	Philadelph'a.	
Clinton.....	49	41	17	20,000	Ontonagon.	
Derby.....	49	41	19	20,000	New York.	
Douglas Hough- ton.....	51	37	15	10,000	Detroit.	
Evergreen Bluff	50	38	6	20,000	Detroit.	
Fire-Steel River	51	37	22	10,000	Pittsburg.	
Flint-Steel R'r	50	39	11	20,000	New York.	
Forest.....	50	39	30	10,000	Boston.	
Glen Falls.....	50	39	31	10,000	Boston.	
Gogebic.....	49	42	22	15,000	Detroit.	
Hudson.....	49	41	11	20,000	New York.	
Indiana.....	51	30	21	20,000	Ontonagon.	
Magnetic.....	49	42	25	....	Detroit.	
Mass.....	50	38	6	....	Pittsburg.	
Merchants'	51	38	35	20,000	Pittsburg.	
Merryweather	48	42	9	20,000	Detroit.	
Metropolitan	49	42	26	15,000	Detroit.	
Minnesota.....	50	39	15	20,000	New York.	
National.....	50	39	16	10,000	Pittsburg.	
Nebraska.....	50	39	12	20,000	Detroit.	
Norwich.....	49	41	11	20,000	New York.	
Ohio.....	51	38	36	....	Cleveland.	
Olgina.....	..	..	..	....		
Ohio Trap.....	49	40	5	12,000	Pittsburg.	
Peninsula.....	50	39	15	....	....	
Ridge.....	51	38	....	3510,000	Pittsburg.	
Rockland.....	50	39	....	1120,000	New York.	
Sharon.....	49	41	9	20,000	New York.	
Shawmut.....	52	36	10	20,000	Boston.	
Superior.....	50	39	14	10,000	New York.	
Toltec Consoli- dated.....	51	30	25	20,000	Boston.	
Victoria.....	..	..	..	....	....	
West Minnesota	50	39	17	20,000	New York.	
What-Cheer.....	51	37	16	20,000	Providence.	
Windsor.....	49	41	12	20,000	New York.	

The annual yield of the most productive of the above workings is shown in the annexed exhibit:

Year.	Adven- ture.	Minne- sota.	Rock- land.	Total of all Workings.
1848	..	4.8	..	4.8
1849	..	39.2	..	39.2
1850	..	77.3	..	80.7
1851	6.2	230.6	..	240.7
1852	14.6	390.1	..	416.9
1853	6.0	392.3	..	499.7
1854	11.6	572.2	16.1	1043.8
1855	31.6	1075.5	119.4	1631.9
1856	73.2	1392.8	177.5	1879.9
1857	123.8	1514.7	284.7	2126.7
1858	68.0	1505.7	181.2	2073.7
Total .....	335.0	7195.2	778.9	10,038.0

Valuing the aggregate produce of these mines at \$500 per ton, the total sum amounts to \$5,019,000.

The "Isle Royale Region" comprises the island so called. In many respects it is the counterpart of the South Shore regions. The ridges of trap traverse the island longitudinally, and this rock, with occasional intercalated belts of conglomerate, forms the whole island. The trap all belongs to the bedded class, and contains the same metaliferous products as Keweenaw Point. The strata have, however, a dip which is just the reverse of that of the rocks on the opposite side of the lake, and their mural faces are turned to the north. The most extravagant notions formerly prevailed with regard to the richness of the island in copper, and soon after the opening of the Lake Superior Region nearly the whole surface was taken possession of by different companies, and operations were commenced at numerous points.

The metaliferous deposits, however, were found not to be generally of that persistent character as to be worthy of being worked, and the island was subsequently abandoned. Only two companies have left records of their operations—namely, the Siskawit, (T. 66, R. 34, S. 13), and the Pittsburg and Isle Royale, (T. 65, R. 36, S. 12), companies, which are represented in the following table:

	Siskawit Company.	Pittsburg & I. R. Co.	Total (tons.)
1849.....	15.8	1.7	17.5
1850.....	15.6	45	20.1
1851.....	18.7	..	18.7
1852.....	31.2	..	31.2
1853.....	14.4	6.2	20.6
Total.....	95.7	12.4	108.1

—making a total product in the years embraced 108.1 tons, or in money, \$54,050.

Having in the foregoing accounts given a rapid sketch of the several districts of the mining regions of the American shores of Lake Superior, the following statement will show the results of each year for each district, and the total production for the whole region:

Years.	Keweenaw Point.	Portage Lake.	Onton- agon.	Isle Royale.	Total (tons.)
1845...	11.3	..	..	..	11.3
1846...	25.3	..	..	..	25.3
1847...	236.7	..	..	..	236.7
1848...	512.3	..	4.8	..	517.1
1849...	697.8	..	39.2	17.5	754.5
1850...	544.4	..	60.6	20.1	645.2
1851...	661.9	..	240.7	18.7	921.3
1852...	598.9	..	416.9	31.2	1047.0
1853...	863.6	12.7	499.7	20.6	1396.6
1854...	1027.5	24.4	1043.8	..	2059.7
1855...	1411.2	226.9	1631.9	..	3370.0
1856...	1638.3	308.2	1897.9	..	3844.4
1857...	1707.6	495.6	2136.7	..	4399.9
1858...	1802.4	754.6	2073.7	..	4630.7

Total 11,739.2 1,822.4 10,038.0 108.1 23,617.7  
Total value of 23,617.7 tons, at \$500 per ton. \$11,853,850

No one can say that, on the whole, eminent success has not been attained. In the fourteen years embraced in the tables the annual product has increased from about 10 tons to nearly 5,000.

A survey of the tables will show that success has not been uniform. Few of the many companies that have been organized, and spent vast sums in explorations and works, have had any return for the capital invested, and many never will have. Yet each of these companies commenced operations under equally favorable auspices. The total product of the year 1858 was due in two-thirds of its amount to one or two companies in each of the districts on the southern shore of the lake—namely, the Pittsburg and Boston, (Cliff,) in Keweenaw Point; the Pewabic and Isle Royale, in Portage Lake, and the Minnesota in Ontonagon. To these are due 3232.4 tons out of the total of 4630.7 tons set down as the year's production.

Mr. Whitney, in his "Mineral Wealth of the United States," wrote up the statistics of this region to the end of 1853. From what data he had been able to collect, he estimated, up to that date, the whole amount of money expended in the region at \$4,800,000, and the value of the copper produced at \$2,700,000. The amount of capital since spent, up to the 31st December, 1858, has probably been an equal sum, making a total of \$9,600,000, or in round numbers \$10,000,000. There are no attainable data to verify this estimate, but it is near

fore stated at \$11,853,850. At the date of the publication of Mr. Whitney's work only \$504,000 had been paid in the shape of dividends, and this only by two companies—the Minnesota and the Pittsburg and Boston—the former having divided \$90,000, and the latter \$414,000. Both have since sustained their regular distributions, and still occupy the first place in the market. Up to the end of 1858, the first company had divided \$630,000, being \$31 50 on each share, on which had been paid only \$3 50, and the latter \$900,000, or \$150 on each of the 6,000 shares issued by the company, for which only \$18 50 had been paid. But, on the whole, we may as well adopt the conclusion come to by Mr. Whitney, who, in his work, before referred to, sums up the position and prospects of the mines of the Lake Region with the following remarks:

"Of the capital thus invested in the country a considerable portion has been expended in opening mines, which may reasonably be expected to become profitable to the adventurers. A very considerable amount was, however, irrevocably sunk during the first years of speculation and foolish excitement. But even at the present very moderate prices of Lake Superior copper stock, their actual cash value exceeds the whole amount that has been expended therefor. The mines of this region have a character of permanence, and there can be little doubt that their product will go on regularly increasing, as it has done in the years since mining operations may be said to have fairly commenced."

The trap range extends into Wisconsin, and has at various times been examined by the geologists of the United States Survey of that State, and by other explorers. The results of their examinations have not been favorable, and there are few veins of copper beyond the borders of Michigan which promise to become of value. The only company at present operating in this region is the Fond du Lac (T. 47, R. 13, S. 8), with 10,000 shares, and the office worked, and this company (the "Montreal," with a capital of £300,000 in £5 shares) ap-

worked, and this company (the "Montreal," with a capital of £300,000 in £5 shares) ap-of which is at Superior City. No shipments have as yet been made from the Wisconsin district.

On the north shores of Lake Superior and Lake Huron, within the territorial limits of Canada and the islands adjacent thereto, mining has at various times been carried on with varying success. The trappean rocks of the region lying behind Isle Royale, and which form lofty cliffs in the headlands and numerous islands of that vicinity, are apparently the counterpart of those of the northern range of Keweenaw Point. No workings are at present going on here; but from 1846 to 1849 a rich vein was worked on Spar Island and the mainland opposite at Prince's Bay. The mine, however, proved unremunerative, although it contained large quantities of native silver; and the high expectations of the stockholders were unfortunately destined to be entirely disappointed. A number of localities were also formerly worked on Michipicoten Island and on the northeast side of the lake. The Quebec and Lake Superior Mining Association commenced operations in 1846, at Pointe Aux Mines, Mica Bay, on a vein said to be two feet wide, and rich in grey sulphuret; but, after erecting furnaces and expending £30,000, it appears that there was little ore to smelt, and the works were abandoned. That there are copper deposits in these regions, however, is abundantly attested, and future efforts may be more successful.

The mines on the north shore of Lake Huron are in a formation consisting of white and often vitreous sandstone, or quartz rock, passing into a jasper conglomerate, and interstratified with heavy masses of trap. These are supposed to be of the same age as the copper-bearing rocks of Lake Superior, and the chief difference seems to be in the great amount of amygdaloid trap present in the former. In these mines the ores are entirely sulphurets, and principally copper pyrites associated with a gangue of quartz. The Bruce mine is the only one now actually

pears to have been eminently successful. The mine is situated about 50 miles below Sault Ste. Marie, and due north of the extremity of St. Joseph's Island. The vein was discovered in 1846, and is contained in a dark-colored hornblende trap. There are several other companies located on the north side of the lake (Huron); and it is probable that the success of the Montreal company will lead to a general opening up of the undoubted resources of the mineral lands of this portion of the American continent.

The ores produced in the Canada mines are all, or mostly all, sent to Swansea for reduction. The total exports of ores and copper from Canada (probably all from the Bruce mine) since 1850 have been as follows:

	Ores. Tons.	Copper. Tons.	Official Value.
1850.....	272.16	62.44	\$36,583
1851.....	1349.82	122.80	86,756
1852.....	598.08	24.92	32,420
1853.....	1639.68	61.60	94,325
1854.....	1731.52	..	103,328
1855.....	1708.00	1.96	91,627
1856.....	1106.51	..	82,834
1857.....	2869.54	3.36	240,942
1858.....	2158.24	2.24	191,949
Total (9 years).-	13,433.45	279.32	\$960,764

The American ores are shipped from the various parts of the southern shore of Lake Superior, and find their way, via the Canal of Sault Ste. Marie, to the smelting establishments at Detroit, Cleveland and Pittsburg, and in a less amount to those at Bergen Point in the Lower Bay of New York, at New Haven, and at Boston, and also to those at Baltimore. The four latter, however, are chiefly supplied with ores from the Appalachian mines of Tennessee, Virginia, etc., and from foreign countries.

On a future occasion the statistics of the copper production of other parts of the Union, and also of the amounts of copper imported into the United States for smelting purposes, may form an interesting article for the columns of the "JOURNAL." On the first point, however, our information is fragmentary, and the disconnection and distance of the producing regions so wide, that it will be difficult to bring toge-

ther the material necessary to its elucidation. With regard to the importation of copper ores the returns are made annually by the Registrar of the Treasury in the tables of "Commerce and Navigation," and require only the labor of compilation to make them available.

#### PRODUCTION OF COPPER IN THE UNITED KINGDOM.

##### 1. MINES, ORES RAISED AND FINE COPPER PRODUCED, 1856.

Localities.	Number of mines worked.	Tons* of ores raised.	Tons fine cop'r produced.
Cornwall.....	135	183,851	12,019
Devon.....	23	47,067	3,138
Cumberland.....	5	4,388	293
Anglesea.....	2	2,688	178
Caernarvon.....	2	1,752	117
Cardigan.....	6	182	12
Radnor.....	2	116	8
Total, England and Wales.....	175	240,044	15,765
Cork and Tipperary.....	4	7,382	775
Waterford, Wicklow, &c. ....	7	5,599	517
Total, Ireland.....	11	12,981	1,292
Sundry Districts not included in the above. . . . .	3 ..	151,654	10,110
Total, United Kingdom .....	187	404,592	27,167
Value in £ stg. ....		1,744,516	2,983,611
Value in dollars.....		8,722,580	14,918,055

##### 2. RESULTS OF 1854, 1855 AND 1856 COMPARED.

	1854.	1855.	1856.
Mines worked, No.	151	165	187
Ores raised, tons.	333,734	359,470	404,592
Metal produced, "	22,286	23,849	27,167
Value of ores. ....	\$7,419,030	8,201,945	8,722,580
Value of metal. ....	\$12,436,875	15,214,385	14,918,055

##### 3. FINE COPPER PRODUCED, 1821-1856.

	Tons.		Tons.
1821.....	11,492	1839 .....	16,425
1822.....	12,340	1840 .....	14,582
1823.....	10,840	1841 .....	14,092
1824.....	10,869	1842 .....	15,218
1825.....	11,601	1843 .....	14,927
1826.....	12,424	1844 .....	16,620
1827.....	13,805	1845 .....	16,668
1828.....	13,650	1846 .....	16,732
1829.....	13,503	1847 .....	15,433
1830.....	14,819	1848 .....	16,486
1831.....	16,472	1849 .....	15,232
1832.....	16,184	1850 .....	16,464
1833.....	14,801	1851 .....	16,016
1834.....	15,732	1852 .....	18,629
1835.....	16,206	1853 .....	19,429
1836.....	16,542	1854 .....	22,286
1837.....	11,368	1855 .....	23,849
1838.....	14,078	1856 .....	27,167

\* Tons of 2,000 lbs.

## CENSUS OF ASSINIBOIA.

Taken by William R. Smith, Esq., 20th May, 1856, under the authority of the Governor and Council of Assiniboa, or Red River Settlement, Hudson's Bay Company's Territories.]

## 1. FAMILIES, DWELLINGS AND INHABITANTS.

Parishes.	Houses.	Families.	Persons.
St. James'	70	68	414
St. John's	93	81	567
St. Paul's	93	91	585
St. Andrew's, Upper	102	93	554
St. Andrew's, Lower	104	121	653
St. Peter's	117	118	596
St. Francois Xavier	97	178	1,101
St. Charles	40	62	348
St. Norbert de la R. Salle	83	101	625
St. Boniface	134	183	1,248
Total, 1856	933	1,095	6,691
" 1849	745	1,052	5,391
" 1843	..	..	5,143

## 2. CIVIL CONDITION OF INHABITANTS.

	1856.	1849.
Men—Married	999	873
" —Unmarried	230	145
Women—Married	1,010	877
" —Unmarried	285	135
Sons—Above 16 years	536	382
" —Under 16 years	1,486	1,314
Daughters—Above 15 years	562	373
" —Under 15 years	1,583	1,292
Total	6,691	5,391
Males	3,251	2,714
Females	3,440	2,677

## 3. ORIGIN BY FAMILIES.

Country.	1856.	1849.	1843.
England and Wales	40	46	22
Scotland	119	129	110
Ireland	13	27	5
Norway	1	3	0
Switzerland	2	2	2
Total European Families	175	207	139
Canada	92	162	152
Rupert's Land (native half-breeds)	828	684	571
Total families	1,095	1,052	862

## 4. RELIGION BY FAMILIES.

Census.	Catholic.	Protestant.
1856	534	548
1849	513	539

## 5. LIVE STOCK.

	1856.	1849.	1843.
Horses	1,503	1,095	821
Mares	1,296	990	749
Oxen	2,726	2,097	..
Bulls	290	155	107
Cows	3,593	2,147	2,207
Calves	2,644	1,615	1,508
Pigs	4,674	1,565	1,976
Sheep	2,429	3,096	3,569

6. LAND, BUILDINGS, IMPLEMENTS, MACHINERY.		
	1856.	1849.
Land cultivated (acres)	8,371	3,392
Houses inhabited	933	745
Stables	1,232	1,066
Barns	399	335
Ploughs	585	492
Harrows	730	596
Carts	2,045	1,918
Canoes	522	528
Boats	55	40
Wind Mills	16	18
Thrashing Mills	9	1
Reaping Machines	8	..
Winnowing Machines	2	..
Carding Mills	6	..
Total	1	..

## 7. CRIMINAL STATISTICS.

(Cases tried in the Petty Local Courts, 1855-6.)

Trespass	Assault and Battery
1	1
Damage or misdemean'r	Defamation
6	1
Against privileges	Total
1	11

—and in the Quarterly General Courts, one other case.

The number of suits for the collection of debts was 27, involving a sum amounting to £46 13s. 6d.

## 8. AVERAGE VALUE OF PROPERTY, (1856.)

Houses	25 at £300	Total	£7,500
" 100 at 100	100	10,000	
" 200 at 50	50	10,000	
" 200 at 25	25	5,000	
" 397 at 12	12	6,764	
Total	922	Total	£39,264
Stables	616 at £8	Total	£4,928
" 616 at 5	5	3,080	

Barns	Total	£8,008
" 199 at £12	199	£2,388
" 200 at 8	8	1,600
Total	399	£3,988
Live Stock—Horses	2,799 at £8 10s	£23,791
" Oxen	3,016 at 4 10	13,072
" Cows	3,593 at 2 10	8,983
" Calves	2,644 at 1 00	2,644
" Pigs	4,674 at 10	2,454
" Sheep	2,429 at 12	1,457

Implement	Ploughs	19,155	Total	£52,401
" Harrows	730 at 5s	5s	183	
" Carts	2,045 at 1 0s	1 0s	2,045	
" Canoes	522 at 12s	12s	313	
" Boats	55 at 15 0s	15 0s	825	

Machinery	Wind Mills	16 at £100	Total	£1,600
" Water Mills	9 at 150	150	1,350	
" Thrashing Machines	8 at 40	40	320	
" Reaping Machines	2 at 30	30	60	
" Winnowing Machines	6 at 2	2	12	
" Carding Mills	1 at 24	24	35	
Total	42	Total	£3,377	
Aggregate Value	..	..	£111,036	

## 8. PUBLIC BUILDINGS, ETC.

Crime	1 Gaol or Jail.
Education	17 Schools, including a College at St. John's.
Religion	9 Churches, viz.: 3 Roman Catholic, 4 Ch. of England, and 2 Presbyterian.
Missions—Church of England	8 3,050 £2,050
" —Presbyterians	1 400 150
" —Roman Catholic	4 2,500 100

## CENSUS OF IONIAN ISLANDS, 1858.

## 1. EXTENT AND POPULATION.

Islands.	Area. sq. m.	Population—			which foreign's
		Males.	Females.	Total.	
Corfu	227	37,796	37,736	75,532	9,700
Cephalonia	311	38,524	37,957	76,481	1,993
Zante	161	20,757	17,870	38,627	436
Santa Maura	156	10,678	9,365	20,043	102
Ithaca	44	5,936	5,412	11,348	..
Cerigo	186	7,016	5,991	13,007	52
Paxo	26	2,729	2,296	5,025	45
Total	1,111	123,436	116,627	240,063	12,323

## 2. POPULATION OF CITIES, ETC.

CORFU (Capital of Republic)	9,271	Ithaca	4,369
Argostoli	14,026	Cerigo	1,393
Santa Maura	4,579	Paxo	404

## 3. OCCUPATION.

Agriculture	49,563	General industry	7,989
Commerce	—	—	6,323

## 4. MOVEMENT OF POPULATION.

Births	5,843	Marriages	5,363	Deaths	1,301
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## 5. LAND APPROPRIATION.

	Acres.	Acres.	
In corn	19,906	In flax	1,849
In maize	52,275	In gardens	302
In barley	4,845		
In grapes	8,031	Total in cultivation	465,927
In olives	265,179	Pasture lands	97,536
In currants	112,918		
In cotton	622	Total	563,463
—leaving	146,577	for uncultivated lands, town plots, &c	

## CENSUS OF TEXAS.

The population of Texas, according to the returns of the Census of 1858, amounts to 457,620. Of this number 138,265 are slaves and 250 free persons of color. Of the whites 67,350 are voters. It is estimated that at least 40,000 immigrants have since the closing of the rolls settled in the State. In 1850 the population was only 212,492, and hence for the eight years the increase is shown at 245,128 or 115.3 per centum.

## POPULATION OF BOLIVIA, 1858.

(According to Col. Juan Ondarza's New Map.)  
Districts. Population.

CHUQUISACA—	Chuquisaca	23,971
	Yamparaez	60,836
	Tominay Azero	84,174
	Cinti	54,687 — 223,668

LA PAZ DE AYACUCHO—	La Paz	99,059
	Omasuyos	103,976
	Yngavi	83,699
	Sicasica	57,666
	Munecas	40,872
	Yungus	36,823
	Larecaja	31,647
	Ynquisibi	19,930
	Misiones	1,650 — 475,322

POTOSI—	Potosi	34,989
	Porco	99,873
	Chayanta	76,684
	Chichas	60,183
	Lipez	9,500 — 281,229

ORURO—	Oruro	29,340
	Paria	52,618
	Charangas	29,973 — 110,931

COCHABAMBA—	Cochabamba	89,918
	Cliza	90,560
	Tapacari	56,989
	Mizque	48,656
	Arque	37,590
	Ayopaya	26,179 — 319,892

SANTA CRUZ DE LA SIERRA—	Santa Cruz	50,636
	Vallegrande	48,148
	Chiquitos	27,500
	Cordillera	26,880 — 153,164

VENI OR BENI—	Veni	4,170
	Mojos	24,503
	Caupolican	21,100
	Yuracares y Guarayos	4,200 — 53,973

TARIJA—	Tarija	23,693
	Salinas	43,890
	Conception	21,317 — 88,900

ATACAMA—Atacama or Cobija		5,273
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1,712,352

Add for uncivilized Indians in the forests—  
—Of Veni..... 100,000  
—Of Santa Cruz .. 40,000  
—Of Chuquisaca and Tarija .. 100,000  
—Of La Paz and Cochabamba. 5,000 — 245,000

\*Grand total..... 1,957,352

Population of Cities—Sucre, 23,979; La Paz, 76,372; Potosi, 22,856; Oruro, 7,980; Cochabamba (or Oropesa), 40,678, and Mizque, 3,786; Santa Cruz, 9,780 and Vallegrande, 3,608; Trinidad, 4,170; Tarija, 5,680; Cobija, 2,680.

\* On p. 155, and in accordance with the "Alm. de Gotha" for 1859, the population of Bolivia is stated at 2,326,126.

[NOVEMBER,

## CENSUS OF ST. LOUIS.

A census of this city, taken in 1858, returned the population at 135,330 souls. Of this number 59,657 were American, 43,874 German, 22,014 Irish, 3,451 English, 1,337 French, and 1,951 foreigners of other origin; and of the total 132,174 were whites, and 3,156 colored, viz.: 1,672 free and 1,484 slave. The increase of the population from 1850 has been as follows:

	White.	Free Col.	Slaves.	Total.
1850	73,842	1,362	2,656	77,860
1852	84,340	1,455	1,859	87,654
1854	..	..	..	122,134
1856	..	..	..	125,201
1858	132,174	1,672	1,484	135,330

— the increase in the eight years being 57,470 or 73.8 per cent.

## CENSUS OF NASHVILLE.

The population of this city, as ascertained by a census taken a few months ago, is 25,115. Of this number 19,728 are white (10,757 males and 8,971 females), and 5,385 colored, viz.: 1,758 free and 3,627 slave. The population of the suburbs is estimated at 6,700, making a total of 31,815. The annual value of manufactures is stated at \$2,374,700, and the total of commerce at \$22,476,812. About a hundred steamers visit the wharves annually, with an aggregate of 108,000 tons.

MINERALS EXPORTED FROM CHILE,  
1857.

The total value of the exports of Chile in 1857 amounted to \$20,126,461, of which sum \$15,981,008 represented the value of mineral exported. The separate values due to the several descriptions of mineral were as follows:

Copper Ores.....	\$2,292,171
Copper Regulus.....	5,027,040
Bar Copper.....	2,908,376 — \$10,227,587
Silver Ores.....	\$1,670,743
Bar Silver.....	1,947,303
Silver Coin.....	1,107,509 — 4,725,555
Copper and Silver Regulus.....	530,130
Gold Coin.....	497,736

Total value..... \$15,981,008

Thus of the total exports more than one-half is found to be copper, and more than one-fourth silver; and that over three quarters of the entire exports consist of copper and silver.

## CITIES OF WISCONSIN.

Basing its calculations on the aggregate vote cast at the late election, and estimating it at one-sixth of the total population, the *Racine Advocate* deduces the following as the number of inhabitants in each of the principal cities and towns of this State:

Cities and Towns.	Vote Cast.	Popul. 1859.
Milwaukee .....	7,790	46,740
Racine .....	1,607	9,642
Janesville .....	1,341	8,046
Oshkosh .....	1,165	6,990
Madison .....	1,116	6,696
Watertown .....	1,027	6,162
Beloit .....	875	5,250
Kenosha .....	794	4,764
Fond du Lac .....	773	4,638
Portage City .....	661	3,966
Berlin .....	511	3,066

The population of Milwaukee in 1850 was only 20,061, and in 1855 only 30,447; that of Racine in the same years was 5,107 and 8,044; that of Janesville, 3,451 and 7,018; and for the other cities the increase is equally remarkable.

## COAL TRADE OF PITTSBURG.

The coal trade of Pittsburg, including the coal from the Monongahela bituminous region, has increased year by year, as shown in the following table:

Year.	Exported. Bushels.	Consumed. Bushels.	Total. Bushels.
1845	2,660,340	2,189,660	4,850,600
1846	5,236,500	2,739,260	7,975,780
1847	7,200,450	2,535,330	9,555,780
1848	7,150,355	2,670,205	9,820,560
1849	7,145,150	2,604,850	9,950,000
1850	8,560,180	3,940,020	12,500,200
1851	8,250,120	4,499,880	12,750,000
1852	9,960,950	4,599,150	14,560,000
1853	11,590,730	4,359,270	15,950,000
1854	14,632,580	3,322,350	17,955,960
1855	18,560,158	4,315,292	22,875,450
1856	8,165,196	1,834,804	10,000,000
1857	25,684,550	3,289,046	28,973,596
1858	24,696,669	4,803,331	29,500,000

These figures show how steady and wonderful has been the increase in this great and important branch of business. Exception the year 1856, in which the Ohio was unnavigable for coal boats for more than 200 days, its progress has been steadily onward. Within the 14 years included in the above exhibit it has increased six-fold. The value of the coal shipped in 1858 amounted to \$3 169,894.

## FRENCH EMIGRATION.

The French Minister of the Interior has published a report on the emigration movement in 1858, showing the following results:

The number of French who emigrated to foreign countries, in that year, was 9,004, and to Algeria, 4,809—making a total of 13,813, being a decrease of 4,926 as compared with the next preceding year. In the number of emigrants to foreign countries the proportion of males was 69 per cent., and that of females 31 per cent., and to Algeria 58 and 42 per cent. respectively.

Of the emigrants to foreign countries, 2,156 went to the United States, 2,510 to South America, 1,558 to Spain, 720 to Switzerland, and 2,060 to other countries.

The emigrants for Algeria embarked at Marseilles, most of them as free passengers. Those for the United States embarked for the most at Havre, and a few for New Orleans at Bordeaux. Those that went from the South of France to the La Plata took shipping at Bordeaux and Bayonne.

The diminution in the number of emigrants in 1858, as compared with the preceding year, was caused, first, by the harvest of last year being more favorable, and next by the commercial and financial revulsion in the United States and the unsettled state of affairs in South America.

The transit of foreign emigrants through France, which in 1857, amounted in number to 26,000, was reduced in 1858 to 11,119.

## PRESBYTERIAN STATISTICS.

For the ecclesiastical year 1858 the returns of the American Presbyterian Church were as follows:

	Old School.	New School.	Total.
Synods.....	33	23	56
Presbyteries.....	168	108	276
Ministers.....	2,577	1,545	4,122
Churches.....	3,487	1,542	5,029
Licentiates.....	297	134	431
Candidates.....	493	370	863
Members added on examination.....	23,945	10,705	34,650
Total communicants .....	279,530	137,990	417,520

## BAPTIST STATISTICS.

The *New York Examiner* states that there are the United States—Associations, 590; churches, 12,163; ordained ministers, 7,590; licentiates, 1,035; communicants, 992,851, and the number baptized in 1858 was 98,508. Among the States, Virginia numbers of this

denomination, 115,146. Connected with the denomination are enumerated 33 colleges; 14 theological seminaries; 29 weekly newspapers, and 16 monthly and 2 quarterly periodicals. New churches erected in 1858, 64; new societies constituted, 238; ministers ordained, 304.

## MASONRY IN THE UNITED STATES.

The following statistics are derived from the latest information contained in the proceedings of the various Masonic Grand Lodges of the United States:

	Lodges.	Members.
Alabama.....	217	7,223
Arkansas.....	103	1,929
California.....	118	4,474
North Carolina.....	107	5,010
South Carolina, estimated.....	66	3,100
District of Columbia.....	11	639
Connecticut.....	55	4,784
Delaware.....	10	452
Florida.....	38	1,234
Georgia.....	221	12,027
Illinois.....	243	8,526
Indiana.....	240	8,594
Iowa.....	108	3,178
Kansas.....	6	170
Kentucky.....	290	9,979
Louisiana.....	103	3,979
Maine.....	83	2,391
Massachusetts, estimated.....	96	3,800
Maryland.....	33	1,626
Michigan, estimated.....	105	5,000
Minnesota.....	24	805
Mississippi.....	205	7,310
Missouri.....	126	4,903
Nebraska, estimated.....	3	100
New Hampshire.....	37	1,731
New Jersey.....	49	2,204
New York.....	409	30,000
Ohio.....	253	10,913
Oregon.....	15	490
Pennsylvania.....	156	11,428
Rhode Island.....	16	1,048
Tennessee.....	174	7,750
Texas.....	212	2,451
Vermont.....	44	2,064
Virginia.....	126	4,614
Wisconsin.....	100	2,907
Total.....	4,202	183,883

The number of Free Masons in the United States is probably much greater than this table shows, as there are many to be found everywhere who are not affiliated with any lodge. The law of fraternity is said to be "once a Mason always a Mason."

## FRENCH RAILROADS.

The following gives the length of the railroads of France on the 31st December :

	1857.	1858.
Northern .....	536.9 miles.	577.5 miles.
Eastern .....	873.1 "	1010.6 "
Ardenne .....	32.5 "	95.0 "
Western .....	600.0 "	715.0 "
Orleans .....	924.6 "	1089.6 "
Mediterranean .....	1042.5 "	1133.2 "
Lyon-Geneva .....	109.4 "	142.5 "
Southern .....	455.6 "	496.2 "
Dauphin .....	55.0 "	80.6 "
Ceinture (round Paris) .....	10.6 "	10.6 "
Besseges-Alais .....	18.7 "	20.0 "
Anzin-Somain .....	11.9 "	11.9 "
Carmat-Albi .....	..	9.4 "
Graissessac-Reziers .....	..	32.5 "
Total.....	4670.8 "	5424.6 "
Aver'e length operated	4296.2 "	5061.2 "
Earnings.....	\$62,221,602	\$67,047,803
Average earnings $\frac{1}{2}$ per mile .....	\$14,459	\$13,248

The average cost of French railroads has been about \$128,340 per mile.

## RAILROADS IN EGYPT.

The railroad from Cairo to Suez being now completed, Egypt possesses the following lines :

From Alexandria to Cairo .....	131 miles.
" " to Mariouth .....	17 "
" " to Meks .....	6 "
" " to Bassateen .....	3 "
" Tanta to Samanud .....	21 "
" Cairo to Suez .....	91 "
" " to Barragod .....	15 "
" " to Beni Sueff .....	76 "
Total.....	360 miles.

—Besides which there are smaller branches from Cairo to the Citadel and Kasr Nin; from Samanud to Mansoura and Damietta, and from Damanhour to Aste and Rosetta. The exact mileage of these minor, but still important lines, is not yet accurately known.

## INDIAN RAILROADS.

The length of railroads sanctioned for British India up to the end of 1858 is 4,847 miles. Of this, the length of 559 miles is opened for traffic, and 3,038 miles is in course of construction —leaving 1,250 miles on which work has not been commenced. In the course of the present year there will be completed 747 miles additional to that already in operation; in 1860,

270 miles more, and in 1861, 296 miles more. Thus at the end of 1861, there will be in India a total length of finished railroad amounting to 1,872 miles. The total capital guaranteed for these railroads is about \$200,000,000, one-half of which has been already paid up. The cost of construction is about \$56,000 per mile, or less than one-third that of English railroads. When the lines are completed there will be four great arterial railroads, opening up the whole of India to the seaboard at Calcutta, Madras and Bombay, and giving to the country commercial facilities which centuries of native rule would not afford to it.

## STATISTICS OF THE STATE OF IOWA, 1859.

No. of Dwelling Houses.....	103,785
Total amount of Population.....	633,449
No. of Males .....	332,806
No. of Females .....	300,743
No. entitled to vote .....	136,457
No. of Militia .....	116,034
No. of acres of Improved Lands .....	3,109,436½
No. of acres of Unimproved Lands .....	7,335,657
No. of miles of Railroad finished .....	390
No. of miles of Railroad unfinished .....	310½
Acres of Meadow .....	172,362
Tons of Hay .....	433,603½
Bushels of Grass Seed .....	48,363
Acres of Sprinkled Wheat .....	750,719
Bushels harvested .....	3,090,049½
Acres of Winter Wheat .....	29,190
Bushels harvested .....	203,204
Acres of Oats .....	315,572½
Bushels harvested .....	1,703,760
Acres of Corn .....	986,096
Bushels harvested .....	23,366,684
Acres of Potatoes .....	24,031½
Bushels harvested .....	1,497,204½
No. of Hogs sold .....	337,261
Value of Hogs sold .....	\$2,111,425
No. of Cattle sold .....	141,146
Value of Cattle sold .....	\$2,950,187

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—The Book of the World—being an account of all republics, empires, kingdoms and nations, in reference to their geography, statistics, commerce, etc., together with a brief outline of their rise, progress and present condition, etc. By Richard S. Fisher, M.D., etc. New York, 1852. (2d Edition.) 2 vols., 8vo, pp. 624-721. With maps and charts.

—Gazetteer of the State of Maryland, compiled from the returns of the 7th census of the United States, and other official documents: to which is added a general account of the District of Columbia. By R. S. Fisher, M. D., etc. New York: 1852. Roy. 8vo, pp. 122.

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—Historical Magazine (*monthly*), 1859. New York: C. B. Richardson, 348 Broadway. In pamph., 8vo.

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—Fregatten Eugenies Resa omkring Jorden, 1851-53. Fysik I. Stockholm, 1858. 1 pamph., 4to., pp. 80.

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—Nautische Geographie von Dr. Heinrich Metzger, Subrector am Gymnasium und Lehrer an der Navigationschule zu Emden. Zweiter Theil—Physikalische Geographie—mit Figuren. Hanover, 1859.\* 1 pamph., 8vo., pp. 55 to 272.

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—Proceedings of the Royal Geographical Society of London. Vol. 2, No. 6, for October, 1858. 1 pamph., 8vo.

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